E318 /451

*Record of*

# The University of North Carolina at Chapel Hill

# School of Medicine

Digitized by the Internet Archive
in 2014

https://archive.org/details/recordofuniversi957univ

# *The University of North Carolina*

## *Sixteen Constituent Institutions*

WILLIAM C. FRIDAY, B.S., LL.B., LL.D., D.C.L., *President*

ROY CARROLL, B.A., M.A., Ph.D., *Vice President — Planning*

RAYMOND H. DAWSON, B.A., M.A., Ph.D., *Vice President — Academic Affairs*

EDGAR WALTON JONES, B.S., M.S., Ph.D., *Vice President — Research and Public Service*

L. FELIX JOYNER, A.B., *Vice President — Finance*

CLEON F. THOMPSON, JR., B.S., M.S., Ph.D., *Vice President — Student Services and Special Programs*

JOHN P. KENNEDY, JR., S.B., B.A., M.A., J.D., *Secretary of the University*

TRUDY ATKINS, A.B., M.F.A., *Assistant to the President for Public Information*

GARY T. BARNES, B.A., Ph.D., *Associate Vice President — Planning*

HUGH S. BUCHANAN, JR., B.A., *Associate Vice President — Finance*

JOHN F. COREY, B.S., M.A., Ed.D., *Associate Vice President — Student Services and Special Programs*

JOHN W. DUNLOP, B.A., *Director, The University of North Carolina Center for Public Television*

DAVID N. EDWARDS, JR., B.A., J.D., *Special Assistant to the President*

KENNIS R. GROGAN, B.S., M.B.A., *Associate Vice President — Finance*

ELLEN H. KEPLEY, *Associate Vice President — Finance*

ARNOLD K. KING, A.B., A.M., Ph.D., *Assistant to the President*

PAUL B. MARION, JR., B.A., M.A., Ph.D., *Associate Vice President — Student Services and Special Programs*

R. D. McMILLAN, JR., B.S., *Assistant to the President for Governmental Affairs*

JEFFREY H. ORLEANS, B.A., J.D., *Special Assistant to the President*

ARTHUR PADILLA, B.S., M.A., Ph.D., *Associate Vice President — Academic Affairs*

RICHARD H. ROBINSON, JR., A.B., LL.B., *Assistant to the President*

DONALD J. STEDMAN, B.A., M.A., Ph.D., *Associate Vice President — Academic Affairs*

ROBERT W. WILLIAMS, JR., A.B., M.A., Ph.D., *Associate Vice President — Academic Affairs*

# *History of the University*

The University of North Carolina is comprised of all the public institutions of higher education in North Carolina that confer degrees at the baccalaureate level or higher. The University was authorized by the State Constitution in 1776, and it was chartered in 1789 by the General Assembly.

The University of North Carolina opened its doors to students at Chapel Hill in 1795. Thereafter, beginning in the latter part of the nineteenth century, the General Assembly of North Carolina has established and supported fifteen other public senior institutions in keeping with Article IX, Section 8 of the Constitution of North Carolina, which provides that the "General Assembly shall maintain a public system of higher education, comprising The University of North Carolina and such other institutions of higher education as the General Assembly may deem wise."

By 1969 The University of North Carolina included six constituent institutions, governed by a single Board of Trustees. This multicampus University had its beginnings in legislation enacted in 1931 that defined The University of North Carolina to include The University of North Carolina at Chapel Hill, North Carolina State University at Raleigh, and The University of North Carolina at Greensboro. In the 1960s three additional campuses were added: The University of North Carolina at Charlotte, The University of North Carolina at Asheville, and The University of North Carolina at Wilmington.

Beginning in 1877, the General Assembly of North Carolina established or acquired ten additional separately governed state-supported senior institutions of higher education. They are: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. Then, in 1971, the General Assembly redefined The University of North Carolina, and under the terms of that legislation all sixteen public senior institutions became constituent institutions of The University of North Carolina.

The constitutionally authorized Board of Trustees of the six-campus University of North Carolina was designated the Board of Governors and this body is by law The University of North Carolina. The Board of Governors consists of thirty-two members elected by the General Assembly, and it is charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." The chief executive officer of the University is the President.

Each constituent institution of the University has its own faculty and student body. The chief administrative officer of each institution is the chancellor, and the chancellors are responsible to the President.

Each constituent institution also has a board of trustees composed of thirteen members: eight elected by the Board of Governors, four appointed by the Governor, and the elected president of the student body *ex officio.* (The School of the Arts has two additional *ex officio* trustees.) The principal powers of these institutional boards are exercised under a delegation of authority from the Board of Governors.

# *Academic Calendar* †*

## *1984–1985*

| FIRST YEAR | | SECOND YEAR |
|---|---|---|
| August 20 | *Registration* | August 20 |
| August 22 | *First day of classes* | August 21 |
| September 3 | *Holiday, Labor Day* | September 3 |
| October 12, 5 p.m. | *Fall recess begins* | October 12, 5 p.m. |
| October 17, 8 a.m. | *Instruction resumes* | October 17, 8 a.m. |
| November 21, 1 p.m. | *Thanksgiving vacation begins* | November 21, 1 p.m. |
| November 26, 8 a.m. | *Instruction resumes* | November 26, 8 a.m. |
| December 18, 5 p.m. | *Christmas recess begins* | December 18, 5 p.m. |
| January 7, 8 a.m. | *Instruction resumes* | January 7, 8 a.m. |
| March 1, 5 p.m. | *Spring recess begins* | March 1, 5 p.m. |
| March 11, 8 a.m. | *Instruction resumes* | March 11, 8 a.m. |
| April 8 | *Holiday, Easter Monday* | April 8 |
| May 10 | *Last Day of Classes* | March 14 |
| Included in course time | *Reading period and Examinations* | March 15–March 29 |
| | *Transition Course* | May 13–May 24 |

*Subject to change
†Daily schedules available at fall registration

## THIRD AND FOURTH YEARS

NOTE: Students in third and fourth years are scheduled on a rotational basis.

### CLERKSHIPS

*Medicine and Surgery*

Surgery: May 29–August 17*
Medicine: June 4–August 24*
September 4–November 21*
November 26–March 1*
March 4–May 24*

*OB-Gyn., Pediatrics, Psychiatry*

May 29–July 6*
July 23–August 31
September 4–October 12*
October 15–November 21*
November 26–January 18*
January 21–March 1
March 4–April 12*
April 15–May 24

*Memorial Day, May 28
Independence Day, July 4
Labor Day, September 3
Thanksgiving Holiday, November 22–25
Christmas Holiday, December 24–January 6
Easter Holiday, April 8

Examinations: To be arranged

### ELECTIVE PERIODS

*Summer Session*

Extra Period — May 7–June 3
1. June 11–July 8
2. July 9–August 5
3. August 6–September 2

*Fall Semester*

4. September 4 (Tues.) – September 30
5. October 1–October 28
6. October 29–November 25
7. November 26–December 23

*Spring Semester*

8. January 7–February 3
9. February 4–March 3
10. March 4–March 31
11. April 1–April 28

Commencement: May 12, 1985

# *Table of Contents*

A Policy Statement of the Faculty / 1

A Letter from the Dean / 3

Student Faculty Relations / 5

General Information
- Officers of Administration / 7
- History of the Medical School / 11
- North Carolina Memorial Hospital / 17
- Area Health Education Centers / 21
- Physical Facilities / 25
- Health Sciences Library / 27
- Associations / 29

Admissions / 31

Financial Information / 37

General University Regulations and Policies / 51

The Academic Program
- Medical Curriculum / 59
- Research and Academic Enrichment / 60
- Requirements for Degrees in Medicine / 60
- Academic Record / 61
- Evaluation of Student Performance / 61
- Description of Curricula and List of Courses For All Four Years / 67

Faculty and Graduate School Curriculum, by Department / 117

Interdisciplinary Programs / 205

Centers, Divisions and Offices / 224

Awards / 235

Student Roster / 244

Index of Faculty

# A Policy Statement of the Faculty

As a state university, we have a special opportunity and challenge for leadership and service in meeting the health needs of the State through programs of excellence in teaching, research, and patient care. One of our goals is to educate the best physicians for the needs of the State. To achieve this, our graduates will include all types of physicians, and many will achieve distinction nationally and internationally, as well as within the State.

The Admissions Committee will give preference to properly qualified residents of North Carolina, and we will also encourage applications for admission from properly qualified nonresidents in order to assure appropriate scope and diversity of the student body.

Some medical schools emphasize the development of practitioners; others emphasize the training of academically oriented physicians. We believe the best education, no matter what future course the student follows, is provided by having a faculty and student body with breadth and a variety of interests, attitudes and goals. In this school we develop both those who will deliver primary care and specialized care, as well as those who will be the next generation of educators and investigators.

We believe that medical students should get a broad training in all major aspects of medical science, practice, and the role of the physician in society. However, because of the ever-increasing complexity of medicine, it seems reasonable to make it possible for some students to make an early career decision and adjust their education accordingly. We present a flexible educational program so that, insofar as possible, students may pace their rates of progress and pursue areas of special interest in depth.

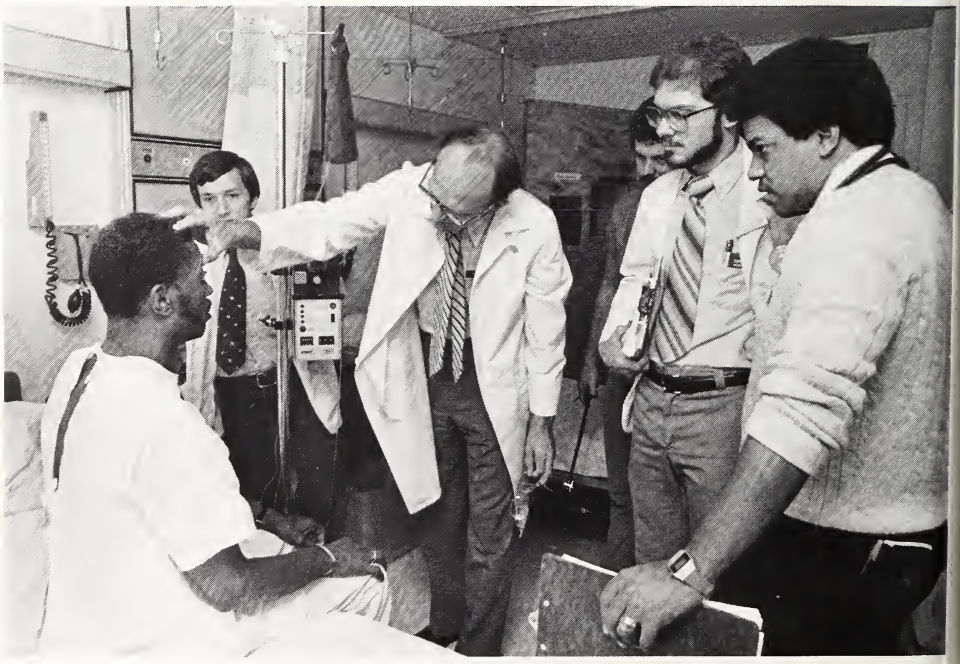
The faculty will assume some responsibility for matters which influence professional performance above and beyond actual course content. These matters include maturation of the student as a unique individual, scholarly stimulation, development of the sense of professional identity and responsibility, and a humanitarian attitude. In addition, we will foster an attitude of desire for continuing acquisition of new knowledge as it develops in the medical sciences. The degree of faculty responsibility in these matters and the techniques for exercising responsibility in these matters are matters of continuing study and formulation by the faculty.

We provide an extensive array of opportunities for academic enrichment beyond the regular curriculum in all major areas of biomedical and clinical science and through the University and the

other health sciences schools in the entire span of knowledge related to health. We encourage students to seek both depth and scope of academic experience beyond the minimum. We encourage some medical students not only to obtain the M.D. degree, but concurrently to obtain sufficient basic science work to qualify for a Ph.D. Also, we support strong educational programs for Ph.D. candidates in medically related sciences.

We intend to give leadership in determining the course of medical education, not only during the traditional four years of the medical school curriculum, but from the time of completion of secondary school until the time of actually starting careers.

We provide leadership in continuing education throughout the physician's entire career. The fact that the majority of our graduates practice in this and neighboring states facilitates our task in this regard and provides us with a special challenge and opportunity.



A catalog is necessarily like a portrait. It is unavoidably incomplete, and it can reflect accurately only a brief interval of time because the programs it describes are in a state of continuing evolution. This catalog presents many aspects of the academic and student life of the School of Medicine. It cannot convey the principles, goals, dedication and humaneness of the people, both faculty and students, who comprise this school. Our broad purpose is to provide an educational basis for a lifetime of learning and service in a health profession and to offer, primarily to young men and women of North Carolina, access to excellence in contemporary medical education. Our graduates regularly enter the most attractive residency programs in the state and nation and distinguish themselves in careers in general and specialty medical practice of all kinds, in biomedical and behavioral research, in teaching and in the administration of health care. Our purpose is also to be a principal source of physicians of the highest competence and most appropriate abilities for the people of North Carolina.

Our educational programs are based both in the major academic health center at The University of North Carolina at Chapel Hill and in six Area Health Education Centers located in communities across

the state. In Chapel Hill, the School of Medicine is associated with outstanding schools of Public Health, Dentistry, Nursing and Pharmacy and with the 650 bed North Carolina Memorial Hospital. Here our students can become involved in the work of advanced science, in both complex and basic patient care, in the development and early application of high technology and in the formal study of social and administrative medicine and ethics. In the Area Health Education Centers, full-time faculty and practicing physicians assure that our students also receive a strong educational experience in the community, the setting in which most physicians and other health professionals will work.

Our curriculum is carefully designed to assure a series of balances: balance between the size of the information base and the learning capacity of the students; balance between theory and practice; balance between professional education and training; balance between biomedical science content and an understanding of man as a social, cultural, and religious being; balance between emphases on prevention, cure and adaptation; balance between care of the individual and care of the community; and balance between scientific understanding and empiricism.

The School of Medicine is especially proud of its record of admission and graduation of black and Indian minorities and it actively seeks to promote student diversity by enrolling minority applicants.

The incorporation of the very best of biological, behavioral and social sciences appropriately into the acts of humane, effective and cost-conscious medical care is a great and continuing challenge. We welcome the interest of prospective students and the commitment and industry of those who join us.

Stuart Bondurant, M.D.
*Dean*

## Student-Faculty Relations

The Medical School is noted for its informal, friendly atmosphere. Students and faculty work together in collegial relationships through the small group teaching in Introduction to Medicine and other courses in the first two years, through research projects, through the advisory system, and in the small rotational groups established in the clinical settings. Advanced students help to teach skills in the physical examination to beginning clinical students. Student preceptors will contribute to the small groups in the Transition Course. In addition, students are encouraged to participate in many School functions. Students give tours to prospective applicants and serve on the School committees such as the Admissions Committee and the Educational Policy Committee. Students took an active part in the recent Curriculum Review, and a new Student Advisory Committee has been formed to work with the Associate Dean for Academic Affairs. A student-student advisory system has been proposed. The Student-Faculty Advisory Council was established several years ago to consider problems shared by students, faculty, and administrators. The Council, chaired by a class advisor, meets monthly.

## Advisory System

A cornerstone of the medical student support system is the class advisory system. Class advisors provide personal and academic counseling. The advisors also serve as student advocates. When indicated, the advisors may recommend one of several resources available through the School and the University. Many students forge close relationships with their faculty advisors, and this opportunity is one of the primary benefits of the advisory system for both students and faculty members who participate. Faculty and students are looking into ways of expanding the advisory system in the new curriculum.

The class advisors for 1983–84 are: Dr. Jeffry Andresen; Dr. Frederic Askin; Dr. Watson Bowes; Dr. James Bryan; Dr. Steven Burnham; Dr. Alan Cross; Dr. Janet Fischer; Dr. Floyd Fried; Dr. Terry Fry; Dr. Harry Gooder; Dr. Mary Jane Gray; Dr. William Huffines; Dr. Henry Lesesne; Dr. Myron Liptzin; Dr. James Mandell; Dr. Valerie Mandell; Dr. Pierre Morell; Dr. Edward Norfleet; Dr. Roy Orlando; Dr. Robert Reddick; Dr. Dennis Ross.

## *The Whitehead Medical Society*

The medical student body was organized into the Whitehead Medical Society in 1908. The society's name honors Richard H. Whitehead, M.D., whose standards and leadership as Dean established the reputation of the School. A governing body of elected officers, representatives and the class presidents is called the Whitehead Council. The society sponsors Fall Orientation, the Whitehead Lecture, and various symposia and social activities throughout the year. Student participation in curriculum review, admissions and many other ongoing activities within the School is encouraged as is involvement in local, state, national, and international medical projects and organizations, and liaisons with the other biological sciences, physical sciences and the humanities. The Society maintains its own Honor Court. A meaningful relationship with the faculty, strong bonds of fellow feeling and individual adherence to a high standard of integrity, social conscience, and academic excellence have always been characteristic of students acting as the Society.

# Officers of Administration

## The University of North Carolina At Chapel Hill

CHRISTOPHER COLUMBUS FORDHAM III, M.D., *Chancellor*

SUSAN HAUGHTON EHRINGHAUS, J.D., *Assistant to the Chancellor*

DOUGLASS HUNT, LL.B., *Special Assistant to the Chancellor*

CLAIBORNE STRIBLING JONES, Ph.D., *Special Assistant to the Chancellor*

HAROLD GENE WALLACE,[1] M.Div., *Acting Affirmative Action Officer*

DONALD ARTHUR BOULTON, Ed.D., *Vice Chancellor and Dean of Student Affairs*

HOWARD GARLAND HERSHEY, Jr.,[2] D.D.S., *Vice Chancellor, Health Affairs*

GEORGE PHILIP MANIRE, Ph.D., *Vice Chancellor and Dean of the Graduate School*

JOHN CHARLES MORROW III, Ph.D., *Provost*

JOHN DOUGLAS SWOFFORD, M.Ed., *Director of Athletics*

ROLLIE TILLMAN, Jr., D.B.A., *Vice Chancellor, University Relations*

HAROLD GENE WALLACE, M.Div., *Vice Chancellor, University Affairs*

FARRIS WADE WOMACK, Ed.D., *Vice Chancellor, Business and Finance*

## The School of Medicine

STUART BONDURANT, B.S., M.D., *Dean*

CHRISTOPHER C. FORDHAM III, M.D., *Dean, Emeritus*

ISAAC M. TAYLOR, B.A., M.D., *Dean, Emeritus*

WILLIAM E. BAKEWELL, Jr., B.A., M.A., M.D., C.M., *Associate Dean*

ROBERT C. CEFALO, B.A., M.D., Ph.D., *Assistant Dean for Graduate Medical Education*

WILLIAM E. EASTERLING, Jr., A.B., M.D., *Associate Dean for Clinical Sciences and Chief of Staff, North Carolina Memorial Hospital*

LUCIA W. HUDSON, *Administrative Assistant*

WILLIAM D. HUFFINES, B.S., M.D., *Associate Dean for Basic Sciences*

GEORGE JOHNSON, Jr., B.S., M.D., *Assistant to the Office of the Dean and Associate Chief of Staff for Inpatient Care, North Carolina Memorial Hospital*

1. Effective November 1, 1983.
2. Effective November 14, 1983.

JUDITH E. LEONARD, B.S., Ed.M., J.D., *Assistant to the Associate Dean for Administration and Assistant Director-Legal, North Carolina Area Health Education Centers Program*

WILLIAM D. MATTERN, A.B., M.D., *Associate Dean for Academic Affairs*

EUGENE S. MAYER, B.S., M.D., *Associate Dean and Director, North Carolina Area Health Education Centers Program*

CONNIE M. MCMANUS, *Registrar*

ERIC B. MUNSON, B.A., M.B.A., *Assistant Dean for Hospital Affairs and Executive Director, North Carolina Memorial Hospital*

EVERETT R. NORDSTROM, B.B.A., *Director of Development*

WILLIAM D. PETASNICK, B.A., M.H.A., *Assistant Dean and Director of Operations, North Carolina Memorial Hospital*

MARION PHILLIPS, B.A., Th.M., D.Mn., *Associate Dean*

JOHN M. SORROW, Jr., B.S., M.D., *Associate Dean for Student Affairs*

JOHN W. STOKES, B.S., *Director of Public Affairs*

CLARENCE N. STOVER, Jr. B.S., M.S., *Associate Dean for Administration*

FRANK T. STRITTER, B.A., M.A., Ph.D., *Director, Office of Research and Development for Education in the Health Professions*

JAMES G. VAUGHN, B.S., C.P.A.,*Assistant Dean for Fiscal Affairs*

SALLY M. WHITAKER, B.A., M.S.P.H., *Student Aid Officer*

RAYMOND P. WHITE, Jr., D.D.S., Ph.D., *Assistant Dean and Associate Chief of Staff for Ambulatory Care, North Carolina Memorial Hospital*

GLENN WILSON, A.B., M.A., *Associate Dean for Community Health Services*

WILLIAM B. WOOD, B.S., M.D., *Director of Continuing Education and Alumni Affairs*

## *Administrative Board of the School of Medicine*

STUART BONDURANT, B.S., M.D. *(Chairman), Professor of Medicine and Dean of the School of Medicine*

MARY C. DOWE, B.S.N., R.N., M.N., Ed.D., *Associate Professor of Nursing*

FREDERICK M. ECKEL, B.B.A., M.H.A., *Professor of Hospital Pharmacy*

DAVID E. EIFRIG, B.A., M.D., *Chair and Dr. and Mrs. Sterling A. Barrett Professor of Ophthalmology*

JAMES E. GRIZZLE, B.S., M.S., Ph.D., *Chair and Professor of Biostatistics*

JOHN H. HARRISON IV, B.S., Ph.D., *Professor of Chemistry and Zoology*

JAMES N. HAYWARD, B.S., M.D., *Chair and H. Houston Merritt Distinguished Professor of Neurology*

H. GARLAND HERSHEY, Jr., B.A., D.D.S., M.S., *Professor of Orthodontics and Vice Chancellor for Health Affairs, ex-officio*

MARY ELLEN JONES, B.S., Ph.D., *Chair and Kenan Professor of Biochemistry and Nutrition*

C. TOWNSEND LUDINGTON, Jr., B.A., M.A., Ph.D., *Cary C. Boshamer Professor of English*

JOHN P. PERKINS, B.S., M.S., Ph.D., *Chair and Professor of Pharmacology*

JAMES H. SCATLIFF, B.S., M.D., *Chair and Professor of Radiology*

EDWARD J. SHAHADY, B.S., M.D., *Chair and Professor of Family Medicine*

P. FREDERICK SPARLING, A.B., M.D., *Chair and Professor of Microbiology and Immunology and Professor of Medicine*

MYRON R. TUCKER, D.D.S., *Assistant Professor of Oral and Maxillofacial Surgery*

CLAYTON E. WHEELER, Jr., B.A., M.D., *Chair and Professor of Dermatology*

EDITH E. WIGGINS, M.S.W., *Assistant Vice Chancellor and Associate Dean for Student Affairs*

## *The Advisory Committee of the Medical Faculty*

STUART BONDURANT, B.S., M.D., *Chairman; Dean and Professor of Medicine*

THOMAS F. BOAT, B.A., M.S., M.D., *Chair and Professor of Pediatrics*

WILLIAM DROEGEMUELLER, B.A., M.D., *Chair and Professor of Obstetrics and Gynecology*

DAVID E. EIFRIG, B.S., M.D., *Chair and Dr. and Mrs. Sterling A. Barrett Professor of Ophthalmology*

JOE W. GRISHAM, A.B., M.D., *Chair and Professor of Pathology*

CHARLES R. HACKENBROCK, B.S., Ph.D., *Chair and Professor of Anatomy*

JAMES N. HAYWARD, B.S., M.D., *Chair and H. Houston Merritt Distinguished Professor of Neurology*

MARY ELLEN JONES, B.S., Ph.D., *Chair and Kenan Professor of Biochemistry and Nutrition*

ERIC B. MUNSON, B.A., M.B.A., *Executive Director, North Carolina Memorial Hospital*

DAVID A. ONTJES, B.A., M.A., M.D., *Chair and Eunice Bernhard Distinguished Professor of Medicine and Professor of Pharmacology*

JOHN P. PERKINS, B.S., M.S., Ph.D., *Chair and Professor of Pharmacology*

EDWARD R. PERL, B.S., M.D., M.S., *Chair and Sarah Graham Kenan Professor of Physiology*

ARTHUR J. PRANGE, Jr., B.S., M.D., *Acting Chair and Cary C. Boshamer Professor of Psychiatry*

ROBERT SAKATA, B.A., M.A., Ph.D., *Chair and Professor of Medical Allied Health Professions*

JAMES H. SCATLIFF, B.A., M.D., *Chair and Professor of Radiology*

EDWARD J. SHAHADY, B.A., M.D., *Chair and Professor of Family Medicine*

GEORGE F. SHELDON, B.A., M.D., *Chair and Professor of Surgery*

P. FREDERICK SPARLING, A.B., M.D., *Chair and Professor of Microbiology and Immunology and Professor of Medicine*

ROBERT W. VAUGHAN, B.S., M.D., *Chair and Professor of Anesthesiology*

CLAYTON E. WHEELER, Jr., B.A., M.D., *Chair and Professor of Dermatology*

GLENN WILSON, B.A., M.A., *Chair and Professor of Social and Administrative Medicine*

WILLIAM E. BAKEWELL, Jr., B.A., M.A., M.D., C.M., *Associate Dean, ex-officio*

PHILIP A. BROMBERG, B.S., M.D., *Director, Environmental Health and Medical Sciences Center, ex-officio*

ROBERT C. CEFALO, B.A., M.D., Ph.D., *Assistant Dean for Graduate Medical Education, ex-officio*

ALAIN T. DROOZ, *Student Representative*

WILLIAM E. EASTERLING, A.B., M.D., *Associate Dean for Clinical Sciences, Chief of Staff, North Carolina Memorial Hospital, ex-officio*

JOHN A. EWING, M.B., Ch.B., M.D., *Director, Center for Alcohol Studies, ex-officio*

WILLIAM D. HUFFINES, B.S., M.D., *Associate Dean for Basic Sciences, ex-officio*

GEORGE JOHNSON, Jr., B.S., M.D., *Assistant to the Office of the Dean and Associate Chief of Staff for Inpatient Care, North Carolina Memorial Hospital, ex-officio*

JUDITH E. LEONARD, B.S., Ed.M., J.D., *Assistant to the Associate Dean for Administration and Assistant Director-Legal, North Carolina Area Health Education Centers Program, ex-officio*

MORRIS A. LIPTON, B.S., Ph.M., Ph.D., M.D., *Director, Biological Sciences Research Center, ex-officio*

WILLIAM D. MATTERN, A.B., M.D., *Associate Dean for Academic Affairs, ex-officio*

EUGENE S. MAYER, B.S., M.D., *Associate Dean, Director, N.C. Area Health Education Centers Program, ex-officio*

WILLIAM W. MCLENDON, B.A., M.D., *Director, Division of Laboratory Medicine and Chairman, Department of Hospital Laboratories, North Carolina Memorial Hospital, ex-officio*

JOSEPH S. PAGANO, A.B., M.D., *Director, Cancer Research Center, ex-officio*

MARION PHILLIPS, A.B., Th.M., D.Mn., *Associate Dean, ex-officio*

HAROLD R. ROBERTS, B.S., M.D., *Director, Center for Thrombosis and Hemostasis, ex-officio*

JOHN M. SORROW, Jr., B.S., M.D., *Associate Dean for Student Affairs, ex-officio*

CLARENCE N. STOVER, Jr., B.S., M.S., *Associate Dean for Administration, ex-officio*

FRANK T. STRITTER, B.A., M.A., Ph.D., *Director, Office of Research and Development for Education in the Health Professions, ex-officio*

JAMES G. VAUGHN, B.S., C.P.A., *Assistant Dean for Administration, ex-officio*

RAYMOND P. WHITE, Jr., D.D.S., Ph.D., *Assistant Dean and Associate Chief of Staff for Ambulatory Care, North Carolina Memorial Hospital, ex-officio*

JOHN B. WINFIELD, B.A., M.D., *Director, Multipurpose Arthritis Center, ex-officio*

WILLIAM B. WOOD, B.S., M.D., *Director for Continuing Education and Alumni Affairs, ex-officio*

# History of the Medical School

There is evidence that medical instruction was given in Chapel Hill before the Civil War but the connection of this undertaking to the University is not clear. The first university-sponsored School of Medicine was established in 1879. Dr. Thomas W. Harris, an honor graduate of the class of 1859 at the University of North Carolina, was Dean and Professor of Anatomy. His only faculty colleagues were Professor A. Fletcher Redd in chemistry and Professor Frederic W. Simonds in botany and physiology. Courses in anatomy formed the basis of the two-year curriculum. Dr. Harris also was able to introduce students to clinical medicine and surgery through the free clinics he established in the community. Dr. Harris received no salary from the University and therefore maintained a large medical practice. The burden of his practice and his teaching responsibilities became too great. When he resigned in 1885 to devote his time to the practice of medicine in the growing town of Durham, 37 students had attended the School of Medicine.

The School was reopened in 1890 with Dr. Richard H. Whitehead as Dean and Professor of Anatomy. His ability as a scientist and teacher established the academic reputation of the School during the following 15 years, a reputation that has persisted through succeeding generations of faculty.

In 1902 University President Francis P. Venable, Dr. Whitehead, and Dr. Hubert A. Royster, Sr. of Raleigh established the University Medical Department at Raleigh. Dr. Royster was appointed Dean and Professor of Gynecology. Despite the inability of the State of North Carolina and the University to finance adequately this expanded operation, the leading physicians in Raleigh, many of whom were already on the faculty of the Leonard Medical College of Shaw University, provided clinical instruction of junior and senior students in the Rex, St. Agnes, and Dorothea Dix Hospitals and the Raleigh Dispensary. In 1910 the Carnegie Foundation for the Advancement of Teaching published the Flexner Report, which recommended standards for medical schools. Because the University could not afford to upgrade both the preclinical and clinical programs to meet recommendations in the report, the department in Raleigh was closed.

Dr. Isaac Hall Manning, the first professor of physiology and biological chemistry, succeeded Dr. Whitehead as dean in 1905. A member of the medical class of 1895, he and a few able colleagues strengthened the basic science departments and improved the preclinical science teaching programs. The reputation of the School

continued to grow, and increasing numbers of students were accepted for transfer to the junior class of leading medical schools in the East, South, and Midwest. Many of these students returned to practice in North Carolina. At the time of the medical school's expansion to a four-year program in 1954, approximately 25% of the physicians practicing in North Carolina had attended the state's two-year medical school.

Caldwell Hall, the first university building planned for medical instruction with adequate laboratories, classrooms, and library space, was completed in 1912. Here the School of Medicine functioned until 1938, when it was moved to MacNider Hall, a new, enlarged basic science building.

In 1923 and again in 1937, state commissions were appointed to study the advisability of expanding the School's program to four years. The University, the medical alumni, and many leading citizens of the State actively supported these efforts. However, lack of funds and controversy over the location of the expanded school foiled these early attempts; Duke University and Wake Forest College subsequently established four-year programs.

Dr. Walter Reece Berryhill became Dean of the School in 1941. His energy, wisdom and foresight, coupled with the support of his able faculty colleagues, ushered in an era of progress for medical education in North Carolina.

In 1947 the North Carolina General Assembly appropriated funds for constructing the 400-bed North Carolina Memorial Hospital, for a modest enlargement of the medical science building, and for educational and dormitory facilities for a school of nursing. This brought to a successful conclusion the statewide effort proposed by Governor J. Melville Broughton in 1944 to improve the health care of North Carolina through state (and subsequently Federal) financial aid for constructing needed hospitals and health centers, increasing medical and health manpower, and expanding the UNC School of Medicine's program to four years.

The North Carolina Memorial Hospital opened in 1952, and the 48 members of the first class in the newly expanded program of the Medical School received the M.D. degree in 1954. An exceptionally able group of clinical department chairmen and faculty whom they had recruited, together with strengthened basic science departments, established the School on a firm basis. The first chairmen of the clinical departments were Dr. Kenneth Brinkhous in Pathology, Dr. Charles H. Burnett in Medicine, Dr. Edward Curnen in Pediatrics, Dr. George Ham in Psychiatry, Dr. Robert A. Ross in Obstetrics and Gynecology, Dr. Nathan A. Womack in Surgery, and Dr. Ernest Wood in Radiology.

In 1964 Dr. Berryhill retired from the deanship and began the development of community clinical education programs. He was succeeded by Dr. Isaac M. Taylor, who led many important changes. Faculty committees carefully reevaluated the medical school curric-

ulum in light of many of the changes that had occurred in medical education and in the complex roles physicians were required to fulfill. A new, interdisciplinary and more flexible curriculum, together with a pass-fail, end-of-year examination system, was instituted in 1967. The Morehead Fellowship Program in medicine was also started. In 1973 graduates of the School scored second among all schools on Part II of the National Board of Medical Examiners. During the late 1960s plans were developed for expanding the physical plant available to the faculty and staff of the medical school and hospital, and funds were obtained through a combination of state, federal, and private sources for implementation of these plans. Projects that resulted from these efforts included Berryhill Hall (Basic Medical Sciences Teaching Facility), the Brinkhous-Bullitt Building (Preclinical Education Building), the Burnett-Womack Building (Clinical Science Building), and the Bed Tower and the Spencer Love Clinics in North Carolina Memorial Hospital.

In mid-1971 the General Assembly approved legislation creating a board of directors for the North Carolina Memorial Hospital and separating it organizationally from the administration of The University of North Carolina at Chapel Hill. Dr. Taylor remained as Dean until June 30, 1971. He was succeeded September 1, 1971 by Dr. Christopher C. Fordham III.

During the past decade many important changes have occurred in the academic medical center in Chapel Hill. There has continued to be substantial growth in the educational programs. The size of the medical student body has increased from approximately 340 students in the 1970–71 year to 641 students in the 1980–81 year. The faculty has increased in size to approximately 600 full-time members, including many promising and distinguished scholars and physicians in the faculty at junior and senior levels. There has been significant growth in the graduate education programs for the training of both basic scientists and clinical specialists, and in the medical allied health area. The overall operating budget of the medical school has more than doubled since 1970–71.

Relationships between the medical school and the North Carolina Memorial Hospital have been strong and collegial, and much progress has been made in the organizational patient care effort. Mr. John Danielson became the first General Director of the North Carolina Memorial Hospital, appointed by the Board of Directors in early 1972; he was succeeded by Mr. Dennis Barry in January 1975. Mr. Barry resigned in 1979, and in 1980 Mr. Eric Munson became the hospital's chief executive officer when he was named Executive Director. The leadership provided by Danielson, Barry, and Munson has enabled the medical staff, headed by Dr. William Easterling, to participate in an increasingly effective way with the hospital administration in seeking the highest quality patient care possible. A good working relationship between the hospital and medical school has developed which enhances the hospital as a learning en-

vironment while maintaining the highest standards for patient care.

When the new health manpower legislation of 1971 created funding for the development of Area Health Education Centers, the University was in a favorable position to seek federal support to initiate such a program because of the good work done in earlier years by Dr. Berryhill and others in establishing strong community hospital relationships. The University received the largest federal grant in the AHEC program, and the single largest contract in the history of the University, amounting to $8.5 million for five years. Mr. Glenn Wilson, the first Director, played a major role in establishing the AHEC program. From the initial three Area Health Education Centers in Charlotte, Wilmington, and the Governor's Area L (Tarboro, Rocky Mount, Wilson, and Roanoke Rapids), the program has grown toward the development of state-wide system of Area Health Education Centers, nine in number, embracing the full participation of our sister health science schools in Chapel Hill as well as the Duke and Bowman Gray Medical Schools, and the health sciences schools at East Carolina University. Programs at the regional centers are designed to develop health manpower training to meet the needs of the 10- to 12-county regions represented by each center. The teachers at each of the centers represent a combination of volunteer, part-time, and full-time faculty broadly based in the health professions. Included among the programs are electives for senior medical students, some rotations for junior medical students, and house staff training in the primary care specialties of Family Medicine, Pediatrics, Internal Medicine, and Obstetrics-Gynecology. The program is supported by the five twin-engine airplanes operated by the Medical Air Transportation Service. This imaginative regionalized program of health professional education has promise for helping to solve North Carolina's problems of access to good medical care through better distribution of physicians and other health professionals, both geographically and by specialty.

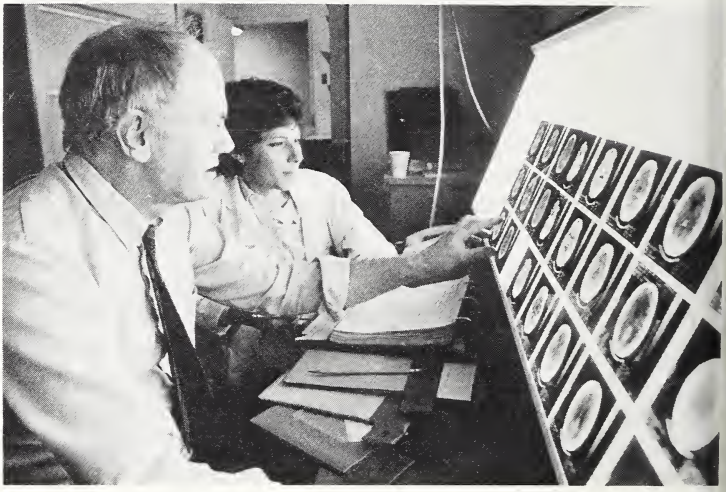
As the academic medical center has grown in size and complexity there has been increasing concern that the scientific medicine practiced there should be properly leavened with human sensitivity, compassion, and genuine continuing interest in people and their families. The North Carolina Memorial Hospital has had the reputation of being a warm, personable place while maintaining its obligation and capacity to keep clinical care at the cutting edge of the medical science.

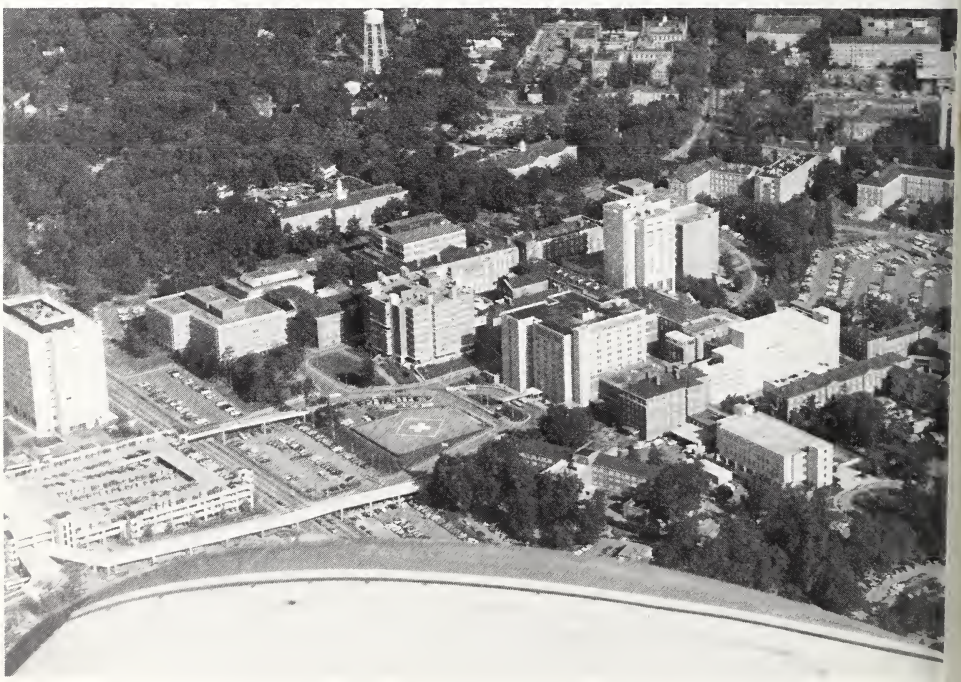
Dr. Fordham assumed the additional responsibilities of Vice Chancellor for Health Affairs in 1977. He relinquished his duties as Dean of the School of Medicine in June 1979 and continued as Vice Chancellor until March 1980 when he became Chancellor of the University.

Dr. Stuart Bondurant was chosen to succeed Dr. Fordham as Dean of the medical school. He assumed his duties as a great decade in the history of the School of Medicine culminated in the school's

being accredited for a maximum 10-year term by the Liaison Committee on Medical Education. Dr. Bondurant's priorities for the beginning of the 1980s reflect his commitment to continuing and enhancing the tradition of excellence in education of The University of North Carolina at Chapel Hill School of Medicine. Actions on these priorities included appointing a faculty curriculum review committee and establishing a Student Research and Academic Enrichment Program. A substantial number of medical students carry out research with a faculty mentor, some work leading to publications. The Curriculum Review reached a successful conclusion with full faculty approval in the spring of 1983. The new curriculum described below in this catalog reflects the goals of faculty and students for the education of physicians in the 21st century.

The reader should draw from this brief history of the School of Medicine the flavor of an institution strongly based on scholarship and fundamentally committed to the scientific medicine of the present and future; it is an institution that has found ways to express these commitments through expanding innovative educational programs in Chapel Hill and throughout the State. It is a School that is equally proud of the achievements of its nationally and internationally prominent faculty in the generation of new knowledge and the excellent teaching provided to students, house staff, and practicing professionals. With this balance of efforts the School continues its tradition of service for the benefit of the health and medical care of the citizens of North Carolina and the nation.





# *The North Carolina Memorial Hospital*

ERIC B. MUNSON, *Executive Director*
WILLIAM D. PETASNICK, *Director of Operations*
ANDREW R. McCULLOCH, *Assistant to the Executive Director*
JERROLD SHENKMAN, *Assistant to the Director (Legal)*
LOUIS J. ORBAN, *Director of Planning*
RICHARD TEBOCKHORST, *Director, Information Services Division*
M. FRANCES ROSS, *Chairman, Department of Nursing*
WALTER PARRIS, *Director, Fiscal Services*
JAMES F. LANE, *Assistant to the Director of Operations*
JOSEPH T. BRUGNOLOTTI, *Director, Professional Support Services*
BEN MOORE III, *Director, Inpatient Care Management*
SIDNEY E. MITCHELL, *Director, General Services*
JAMES BICKET, *Director, Ambulatory Care Management*
ELAINE M. HILL, *Director, Volunteers*
JOHN STOKES, *Director, Public Affairs*

## EXECUTIVE COMMITTEE OF THE MEDICAL AND DENTAL STAFF

WILLIAM E. EASTERLING, JR., M.D., *Chief of Staff, Chairman*
GEORGE JOHNSON, JR., M.D., *Associate Chief of Staff for Inpatient Care*
RAYMOND P. WHITE, JR., D.D.S., *Associate Chief of Staff for Ambulatory Care*
DAVID ONTJES, M.D., *Vice Chief of Staff*
THOMAS BOAT, M.D., *Secretary*

BEN D. BARKER, D.D.S., *Dean, School of Dentistry*
THOMAS BOAT, M.D., *Pediatrics*
STUART BONDURANT, M.D., *Dean, School of Medicine*
MARC CARR, M.D., *House Staff*
WILLIAM DROEGEMUELLER, M.D., *Obstetrics and Gynecology*
DAVID EIFRIG, M.D., *Ophthalmology*
JOE GRISHAM, M.D., *Pathology*
FRED R. HANSEN, M.D., *Emergency Medical Services*
JAMES HAYWARD, M.D., *Neurology*
WILLIAM MCLENDON, M.D., *Hospital Laboratories*
DAVID A. ONTJES, M.D., *Medicine*
ARTHUR PRANGE, M.D., *Psychiatry*

FRANCES ROSS, B.S.N., *Nursing*
ROBERT SAKATA, Ph.D., *Medical Allied Health*
SUZANNE SAUTER, M.D., *Rehabilitation Unit*
JAMES SCATLIFF, M.D., *Radiology*
EDWARD SHAHADY, M.D., *Family Medicine*
GEORGE SHELDON, M.D., *Surgery*
MARTIN ULSHEN, M.D., *Member-at-Large*
ROBERT VAUGHAN, M.D., *Anesthesiology*
CLAYTON WHEELER, JR., M.D., *Dermatology*
WILLIAM D. PETASNICK, M.H.A., *Ex-Officio, Director of Operations*
ERIC MUNSON, M.B.A., *Ex-Officio, Executive Director*

The missions of North Carolina Memorial Hospital (NCMH) are education, research, patient care and community service. In carrying out this mission, the 650-bed facility offers rich and varied clinical (and personal) experiences to medical students at The University of North Carolina. Serving as the tertiary care center for the state, NCMH also provides quality primary care to a large number of persons in the region. The faculty, serving as attending physicians, sets high standards for the scholarly practice of clinical medicine that is both caring and fiscally responsible. Students are included in the patient care team early in their education; while they learn by observation and questioning the faculty and housestaff, medical students also meet medical and emotional needs of patients and their families who often become anxious in the environment of a modern medical center.

More than 20,000 patients are admitted to NCMH annually. The hospital's emergency room, which registers more than 30,000 persons a year, is part of a comprehensive Trauma Center. Virtually all wards have been renovated in the past decade and construction on a Critical Care Facility represents the most recent of many major additions to the hospital. Students and physicians in training work with innovative and specialized diagnostic and treatment modalities. The Medical Center is recognized nationally for clinical research and care in specialized services such as the Burn Center, the Comprehensive Hemophilia Center, Perinatal Care, and the dialysis program, among others.

North Carolina Memorial Hospital serves as a source of primary care for a substantial segment of the local community. This commitment to primary care distinguishes NCMH from many of the tertiary care training centers, and in conjunction with AHEC hospitals, provides students with a balanced experience in providing health care. There are more than 160 clinics, involving 265,000 patient visits, at NCMH. Ambulatory care services offer a number

of new approaches to health care delivery including an active outpatient surgery program. The Polyclinic Practice allows continuity of care with the physician of choice, immediate specialty consultations when needed, and innovative quality assurance and health maintenance programs. The Family Practice Center and obstetrical services emphasize family-centered approaches. In addition, walk-in and screening clinics provide immediate medical attention to persons who are often missed by traditional medical practices. The Pediatrics Department sends students and interns into the community as participants in child-related activities. Finally, the Student Health Action Committee (SHAC) provides a weekly student-run evening clinic for persons of south Orange County who have no other source of medical care. The Department of Family Medicine and volunteer faculty members in the health professions provide support and supervision, and the hospital provides laboratory and pharmacy support.

MEMORIAL
HOSPITAL

# *Area Health Education Centers Program*

*Director:* Eugene S. Mayer, M.D.
*Deputy Director:* John A. Payne, M.P.H.
*Associate Directors:* Clark W. Luikart, Ph.D., Judith E. Leonard, Ed.M., J.D., and Kathleen M. McDonald, M.S.
*Senior Associate for Clinical Education in AHEC:* Donal Dunphy, M.D.

The North Carolina Area Health Education Centers (AHEC) Program is a unique partnership between the university health science center and the community designed to (1) provide off-campus education and training opportunities for medical students and residents and (2) ready access to continuing education and teaching activities for health professionals and practitioners throughout North Carolina.

Under the leadership of the Dean and the faculty of the School of Medicine at The University of North Carolina at Chapel Hill, the AHEC Program has been developed in cooperation with the other UNC-CH health science schools, the Bowman Gray School of Medicine of Wake Forest University, the Duke University Medical Center and the East Carolina University health science schools (Medicine, Nursing and Allied Health). Also included in this statewide educational program are community hospitals, other university campuses, community colleges, technical institutes, and practicing professionals and support personnel.

The AHEC Program, through its nine regional centers (AHECs) is designed to:

1. Provide medical, dental, public health, pharmacy, allied health and nursing students with education and training opportunities throughout the state.
2. Enhance regional capabilities to train nursing and allied health personnel.
3. Enhance the regional capability to train primary care medical residents.
4. Provide opportunities for continuing education, in-service education, and individualized technical assistance and consultation for all health personnel.

The AHEC Program is based on the premise that the organization of the educational process can influence the practice orientation, career selection, and eventual practice location of students and resi-

dents. More specifically, the decentralization and regionalization of education and training programs will increase exposure to primary care and community practice, thus improving the likelihood that students and other trainees will choose careers in primary care and practice in medically underserved communities. Further, it is also assumed that the presence of technical assistance, information services, and educational programs in the community will improve the character of the professional practice environment, and enhance the ability of the state to improve the distribution of health manpower as needed.

The nine AHECs mandated by the General Assembly of North Carolina are established and operating as a statewide network. Each AHEC is a community hospital or an incorporated foundation representing one or more hospitals which agrees to accept the responsibility for health manpower education and training programs in a multicounty area. These programs represent a coordinated effort to provide education at the undergraduate, graduate and continuing education levels in a manner which reflects regional and statewide needs, focuses on primary care, and protects both academic quality and the integrity of health services delivery in the community.

The statewide AHEC network for health manpower education and training was implemented in 1972, and currently involves:

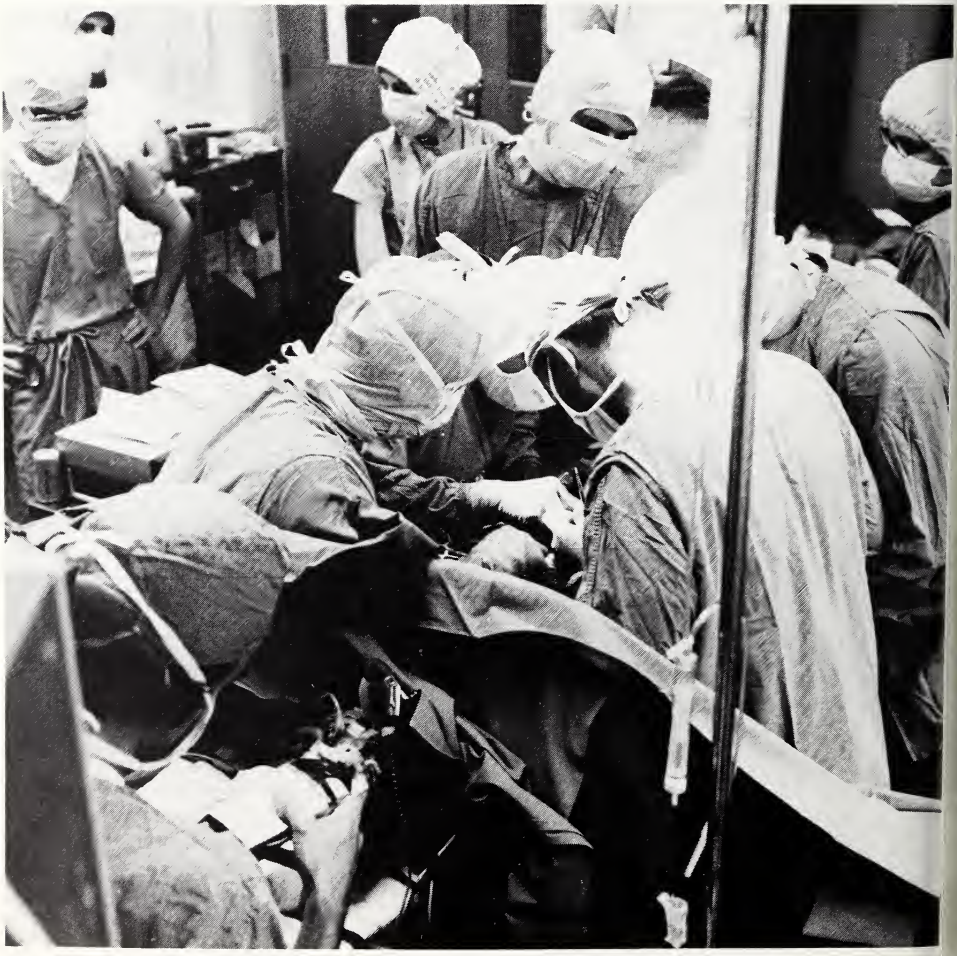
1. The presence of approximately 80 AHEC-based, full-time and part-time medical faculty, and over 40 AHEC-based full-time faculty in other health disciplines.
2. The regular presence in the AHEC regions of visiting faculty and staff from the university health science schools, and the regular presence of AHEC-based faculty at the university health science center.
3. The voluntary support and participation of community physicians and other health professionals, administrators, and support personnel from the AHEC hospitals and the AHEC regions.
4. A network of libraries and learning resource centers which connect almost all community hospitals to an AHEC and, in turn, to a university health science library.

The AHEC Program has enabled the UNC-CH School of Medicine to establish teaching programs at a number of community hospitals and practice sites throughout North Carolina. Major community hospitals affiliated with the UNC-CH School of Medicine which serve as clinical sites for AHEC rotations for medical students include: Moses Cone Memorial Hospital in Greensboro, Charlotte Memorial Hospital and Medical Center in Charlotte, Edgecombe General Hospital in Tarboro, Nash General Hospital in Rocky Mount, Halifax Memorial Hospital in Roanoke Rapids, Wilson Memorial Hospital in Wilson, Memorial Mission and St. Joseph's

Hospitals in Asheville, Wake County Medical Center in Raleigh, and New Hanover Memorial Hospital in Wilmington.

Presently about one-third of all clinical education for UNC-CH medical students occurs in the AHECs. These well-supervised experiences are designed to develop clinical skills, to demonstrate primary care practice, and to expose students to the opportunities and challenges of community-based medical practice.

The medical student's full-time assignment of at least ten days at the end of the second year to a Physical Diagnosis course may be arranged through the AHEC Program at a facility away from Chapel Hill. All medical students spend one-third of their third-year Medicine clerkship, and may spend all or part of the Obstetrics-Gynecology and Pediatrics clerkships, in an AHEC site. Assignment of the Psychiatry clerkship may be to a mental health clinic or hospital in an AHEC region. Fourth-year assignments to the Family Medicine selective frequently involve physicians' offices in the AHEC regions. The fourth-year acting internship selective often takes place in an AHEC hospital and, in addition, many other clinical electives are offered in AHEC settings.



# Physical Facilities

MacNider Hall was constructed in 1938 as the primary site for medical education. Additions were made in 1952. In 1963 the Medical Sciences Research Building was completed. A new research building, the six-story Swing Building, was occupied early in 1970. The Biological Sciences Research Center, including the Child Development Institute, was completed and occupied in early 1971. Buildings which previously housed nurses' dormitories and classrooms and the outpatient clinic have been renovated as office areas for the School of Medicine and for the Hand Rehabilitation Center.

Berryhill Hall, occupied in 1971, houses teaching facilities for the medical students within its eight-story structure. Students have the advantage of a modern teaching structure which provides well-equipped multidiscipline laboratories for small groups. Each medical student is assigned a laboratory desk. The desk is assigned for a year at a time and has ample storage for books, supplies and equipment. The student has free access to the desk for independent study. This building also houses a snack bar, a large student lounge, and four auditoria equipped with comprehensive audiovisual aids. Within the building also are multipurpose teaching laboratories for the basic science departments of the School of Medicine. These laboratories are used by other students in Health Affairs for whom the School of Medicine has teaching responsibility. The Division of Laboratory Animal Medicine is also housed in this building.

The Brinkhous-Bullitt Building was completed in 1973. This building houses administrative, service, and research space for the Department of Pathology, the Office of the N.C. State Medical Examiner, and the North Carolina Memorial Hospital Mortuary Facilities. The Burnett-Womack Clinical Sciences Building was completed in 1975. This facility provides research and administrative space for several clinical departments. In addition, four limited life buildings have been constructed for clinical faculty.

During the summer of 1978 activation began for the 11-story Faculty Laboratory Office Building. Housed in this facility are the Departments of Microbiology and Immunology, Biochemistry and Nutrition, Pharmacology, the Division of Laboratory Medicine, the Division of Immunology and Rheumatology in the Department of Medicine, and the Division of Laboratory Animal Medicine.

Construction began on the Lineberger Cancer Research Center Building in December 1981. The 35,000 square-foot, three-story building opened in January 1984. Its site is between Manning Drive and King Street, behind the Faculty Laboratory Office Building.

The Lineberger Cancer Research Building provides administrative offices, a library and conference room, laboratory and office space for faculty investigators and facilities for research in chemical carcinogenesis, recombinant DNA and viruses. In addition, the building will have specialized rooms for existing tissue culture and electron microscopy.

## STUDENT HEALTH SERVICE

The University offers a comprehensive program of health care for its student body and provides a Student Health Service with both inpatient and outpatient facilities.

The Health Service is staffed with physicians, psychiatrists, clinical psychologists, counselors, pharmacists, and a full nursing complement. In addition to programs for physical and mental health, there is also a Sports Medicine Program and a Health Educator. The Student Health Service also provides certain specialty clinics, including dermatology, ENT, eye, gynecology, and orthopedics.

Patients may be seen either by appointment or on a walk-in basis. At the discretion of the attending physician, a student may be admitted as an inpatient. Certain highly specialized services (major surgery, consultations, certain types of laboratory and X-ray procedures) not available at the Health Service are rendered by North Carolina Memorial Hospital or commercial laboratories at standard rates. Charges are made for routine procedures not directly related to a student's health (such as pre-employment physical examinations) and for services rendered between regular University sessions when the student is not actually enrolled.

The University also provides the opportunity to purchase supplemental hospitalization insurance through a group program which provides coverage for married students and their families as well as for single students. It is strongly recommended that students have additional health insurance such as the one offered.

## VETERANS AFFAIRS

Veterans affairs and claims for veterans benefits are handled by the Veterans Advisor, 101 Hanes Hall 019A, The University of North Carolina at Chapel Hill.

## HOUSING

The University provides residence hall accommodations for approximately 6600 registered students — undergraduate, graduate and professional men and women. Three hundred and six apartments are available for student family housing. These apartments are conveniently located near the medical center.

Information regarding residence hall accommodations is available by writing to: Department of University Housing, Contracts Office, Carr Building 103A, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27514.

Information regarding student family housing is available by writing to: Manager, UNC Student Family Housing, Odum Village, Branson Street, Chapel Hill, NC 27514.

## *Health Sciences Library*

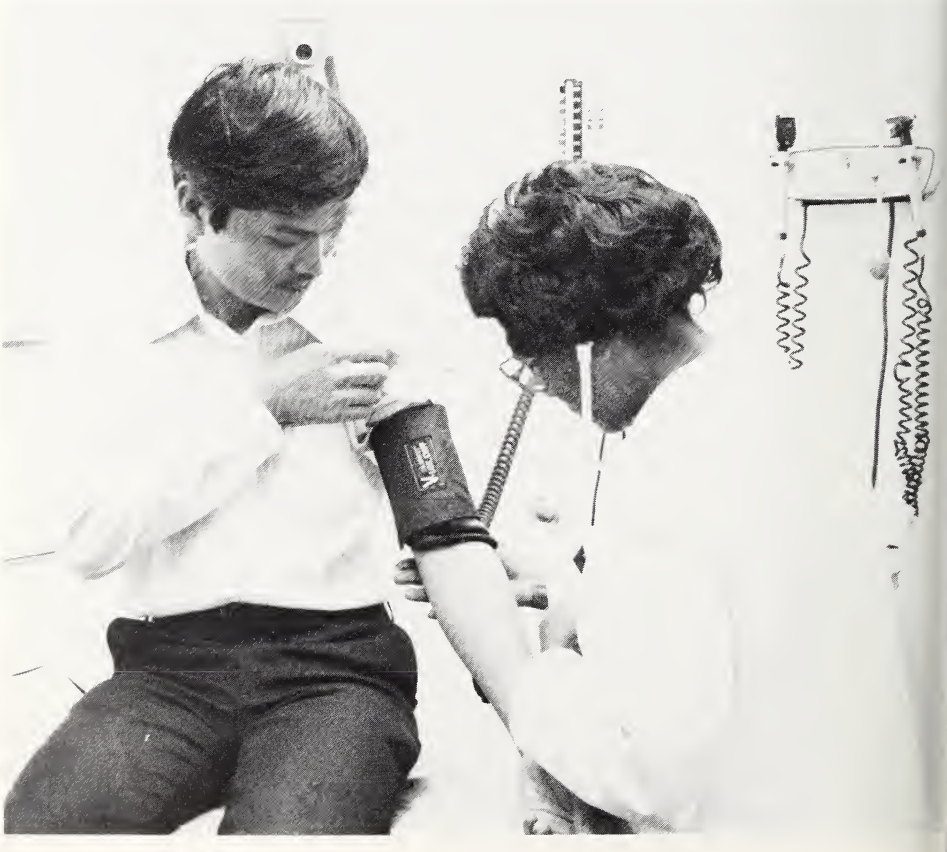
The Health Sciences Library, located on Columbia Street with the entrance facing the MacNider Building, has facilities, collections, and staff which place it among the top ten of the over 130 U.S. and Canadian medical school libraries. The new six-story building, finished in 1982, has seating for 731 users. The collection includes over 202,000 print volumes, 3,300 audiovisual programs, 25,000 microform pieces, and current subscriptions to about 4,000 periodicals. A fine rare books collection is supported by the Anderson-Riggins endowment.

Staff in ten departments serve the information needs of students, faculty, and staff of the Division of Health Affairs, the North Carolina Memorial Hospital, and health care professionals in North Carolina through the Area Health Education Centers (AHEC) program. The library offers a wide range of information assistance, including aid in locating factual and bibliographic information, online search services, information management education programs, individual instruction in the use of information sources, circulation of library materials, interlibrary loan services, photocopy services, and a reserve collection for assigned course materials. Information Services librarians search over 85 different computer databases including MEDLINE, TOXLINE, HEALTH, BIOSIS, *Excerpta Medica, Chemical Abstracts, Psychological Abstracts,* and *Science Citation Index.* The new department of Information Management Education Services coordinates orientations for new library users and offers special library and classroom courses on such topics as personal filing systems, grant research strategies, and doing one's own computer database searching. The large audiovisuals center contains carrel and group study seating and provides equipment for using 35 mm slides, ¾ inch videocassettes, videodiscs, audiocassettes, and microforms.

The Health Sciences Library is directed by Samuel Hitt. Other key staff include Gary Byrd, Associate Director, and the following department heads: Wallace McLendon (Circulation Services), Nidia Scharlock (Information Services), Diane Foxman (Audiovisual Services), April Wreath (Cataloging Services), Jo Anne Boorkman (Collections Development Services), Marjory Waite (Acquisitions/Serials Services), Ellen Brassil (Information Management Education Services), Nancy Bruce (Rare Books Services), and Lynn Siemers (AHEC Liaison Librarian).

Additional information regarding the services and collections of the Health Sciences Library may be found in brochures in the library's *Information Series* and in its newletter *News & Views*. A selected list of recent books, journals, and audiovisuals acquired by the library is mailed monthly to each department and to interested faculty and staff upon request. Telephone inquiries should be directed to Information Services (962-0700), Circulation Services (962-0800), Audiovisual Services (962-0600), or Administrative Services (966-2111).

The University libraries serving the Division of Academic Affairs including the Wilson and new Davis Libraries are also available to students and faculty of the School of Medicine. The total collections of the libraries in Chapel Hill now exceeds 3,000,000 volumes.



# Associations

## MEDICAL ALUMNI ASSOCIATION

Graduates of the UNC School of Medicine (both M.D. recipients and basic science graduates), former housestaff of NCMH, and faculty are automatically members of the UNC Medical Alumni Association. The Association meets annually in the spring and holds other meetings throughout the year. There are no membership dues.

The *Medical Alumni Bulletin* and *Alumni Times* are published quarterly and serve as a means of communicating with the alumni. These publications, several student scholarships, sponsored student activities, and other activities of the Association are possible through contributions to the Medical Alumni Loyalty Fund. The Loyalty Fund is held in trust by the Office of Medical Alumni Affairs.

Dr. William B. Wood, the Director of Continuing Education and Alumni Affairs, is responsible for the administration of the alumni office. The office is also staffed by an alumni secretary. Office is located in 231 MacNider Building.

## AMERICAN MEDICAL STUDENT ASSOCIATION

Membership in the University of North Carolina Chapter of the American Medical Student Association is available to medical students on a voluntary basis. AMSA is a national organization which is extremely active in all aspects of student involvement in the field of medicine. The local chapter works in close conjunction with the Whitehead Society in order to give the student not only a feeling for the local problems involved in medical practice but also an understanding of many of the same problems on a national or even a worldwide level.

## STUDENT NATIONAL MEDICAL ASSOCIATION

The Student National Medical Association was established in 1964 as an affiliate of the National Medical Association. The University of North Carolina Chapter was founded in 1971. Membership in SNMA is voluntary and does not supplant any other organization. The local chapter is involved in particular areas of specific interest to black students. In this role, close liaison is maintained with the Whitehead Society and the AMSA. Members of the SNMA may also be members of these latter student organizations, providing a wider opportunity for understanding of local and national health problems.

## MEDICAL PARENTS CLUB

The Medical Parents Club consists of the parents of students and alumni of the School of Medicine of the University of North Carolina at Chapel Hill who desire to be members. The objectives of this organization are: (1) to generate and maintain the interest of parents of current, future, and former students in the Medical School; (2) to inform these parents about the School of Medicine, its background, present work, and future plans; and (3) to serve to guard and to advance the School of Medicine.

# Admissions

The University of North Carolina School of Medicine has a special opportunity and responsibility to educate physicians who can help meet the health care needs of the state and the nation. Because the size of entering classes is fixed, not all worthy applicants can be admitted. It is the duty of the Admissions Committee acting for the Dean and the faculty to select the students who in its judgment will best provide excellence and beneficial diversity in the student body.

Admissions preference is given North Carolina residents and it has been the consistent policy of the School of Medicine to consider classifications for tuition purposes as determining residency classification for all admissions decisions.

The School of Medicine is a participant in the American Medical College Application Service. Information provided in the AMCAS application is used to predict success in medical studies. North Carolina residents who have demonstrated adequate preparation and ability are invited to complete a supplementary application.

Through the supplementary application and personal interviews, each applicant is given the opportunity to acquaint the Committee with his/her unique attributes. In making its final selections from the group of qualified in-state applicants, the Committee considers evidence of each candidate's motivation, maturity, industry and integrity, as well as the scholastic record. To provide a heterogeneous student body, the Committee considers a variety of individual qualifications and accomplishments. All information available about each applicant is considered without assigning priority to any single factor. No special admission tracks or quotas are applied among in-state applicants.

The number of nonresident applications who can be admitted is limited. The Committee is extremely selective in choosing out-of-state applicants to submit supplementary applications and to come to Chapel Hill for interviews. The Committee offers admission to a few nonresident students judged especially able to contribute excellence and diversity to our student body.

All admissions to the School of Medicine are the ultimate responsibility of the Dean. The Dean and the Committee reserve the right to exercise their judgment in selecting a student body deemed best qualified to meet the objectives of the School.

## ACADEMIC REQUIREMENTS FOR ADMISSION

1. A minimum of 96 semester hours of accredited college work is required.[1] Students are encouraged to pursue one or more scholarly interests in depth during the undergraduate years, but course work must demonstrate proficiency in the natural sciences. Advanced courses in biology, chemistry, and mathematics are recommended. Studies in the humanities and social sciences are valued. Facility in oral and written communication is essential. Specific courses include:

| | Sem. hrs. |
|---|---|
| English | 6 |
| Biology including vertebrate zoology with labs | 8 |
| Inorganic and organic chemistry including courses in qualitative and quantitative analysis with labs | 16 |
| General physics with labs | 8 |

2. Beyond the fixed requirements a wide variety of undergraduate educational experiences are appropriate to medicine. The School values a pattern of preparation for medicine which shows serious and mature use of the undergraduate years.
3. The new Medical College Admission Test is required. The test must be taken no later than the fall prior to the entering class for which the student is applying. Application for the test is made directly to the American College Testing Program, P.O. Box 468, Iowa City, Iowa 52240.

## PROCEDURE FOR APPLICATION

1. Application forms are available from the American Medical College Application Service (AMCAS), Association of American Medical Colleges, 1776 Massachusetts Ave., N.W., Suite 301, Washington, D.C. 20036 (tel. 202-466-4666). The UNC deadline for the class entering August 1985 is November 15, 1984. Applicants are notified when the AMCAS application has been received by the UNC School of Medicine. The AMCAS application is reviewed by the Committee. Academically qualified North Carolina applicants and selected nonresident applicants are sent

1. A few University of North Carolina undergraduate students with superior academic credentials may qualify for a B.S. in Medicine degree. Eligibility for this degree is dependent upon (a) admission to the School of Medicine, (b) completion of at least the last year of premedical work at The University of North Carolina, (c) satisfactory completion of the first year of the School of Medicine. Specific course requirements for this degree may be obtained from the College of Arts and Sciences.

a supplementary application and instructions for proceeding with the admissions process.

2. Complete all supplementary material which includes:
   a. A supplementary application form
   b. The form(s) relating to claiming North Carolina residence for tuition purposes.
   c. Letters of recommendation: An evaluation from the Premedical Advisory Committee, or when no such report is available, two letters of recommendation from faculty members (at least one science instructor and one in the applicant's major field.) Any additional letters from responsible persons well acquainted with the applicant are welcomed but not required.
   d. A nonrefundable, nondeductible application fee of $15.00.

Applicants submitting the supplementary applications usually are invited for interviews.

Applicants will be notified when their files are complete. Careful consideration of all applicants is a time-consuming process, and selection of the class is not complete until spring. Applicants are notified when action has been taken by the Committee.

Accepted applicants are required to make a deposit of $100.00 to hold their places in the class. This deposit is refundable prior to June 15; if the applicant registers in August, this amount is applied to tuition fees.

## EARLY DECISION PLAN

The UNC School of Medicine participates in the AMCAS Early Decision Program. The admissions philosophy and procedures outlined above are applied to early decision applicants. Highly qualified applicants are encouraged to consider the Early Decision Plan as outlined in AMCAS instructions.

## TRANSFER/ADMISSION TO ADVANCED STANDING

It is the policy of the School of Medicine to limit consideration for transfer/advanced standing admission to the third year. Placements are contingent upon vacancies in the class. Only two categories of candidates may apply:

1. Medical students enrolled and in good standing at a medical school accredited by the Association of American Medical Colleges.
2. Selected residents in the Oral Surgery Program at the UNC School of Dentistry.

Eligible applicants may obtain application materials by writing to Admissions, UNC School of Medicine, 121 MacNider Hall, 202-H, Chapel Hill, NC 27514.

# Combined Degree Programs

## M.D.-Ph.D.

The clinical investigator (research physician) plays a critical role in advancing medical care. Since research involving human subjects requires the participation of a medically-trained investigator, he or she is responsible to a considerable extent for the translation of new knowledge from basic research to the care of patients. The faculty of the School of Medicine recently reaffirmed its commitment to recruit, encourage, develop and support students who may become future leaders in medical research. The M.D.-Ph.D. program, which usually takes six to seven years to complete, may be considered by applicants who have completed advanced coursework in science and/or have had research experience. The Ph.D. may be in any of the basic biomedical sciences or in other natural and behavioral sciences. The sequence of coursework and research experience can vary according to the student's needs. A typical program is two years of medical school, followed by three years in graduate school, then returning to medical school to complete clinical training.

A limited number of fellowships are awarded to M.D.-Ph.D. candidates. Interested students should direct questions to William D. Mattern, M.D., Associate Dean for Academic Affairs, 122 MacNide, (202H), School of Medicine (919-966-4161). Students should indicate their interest in pursuing a combined degree. Graduate Record Examinations are recommended.

## M.D.-M.P.H.

Through a cooperative arrangement between the School of Public Health and the School of Medicine, UNC medical students interested in preparing for a career that combines clinical medicine with health policy, medical administration, public health (either in the United States or internationally), or epidemiological investigation, may pursue a dual degree program leading to the M.D. and the M.P.H. or M.S.P.H. Students who have made formal application and have been accepted by a department in the School of Public Health and by the Graduate School must enroll in the School of Public Health full time for a minimum of one semester — usually after the third year of medical school — in order to complete degree requirements. Among the graduate programs in public health that frequently include medical students are those of the departments of Epidemiology, Health Policy and Administration, and Maternal and Child Health. Students may receive elective credit in the School of Medicine for up to fifteen hours of course credit earned toward a public health degree. UNC medical students interested in pursuing the M.D.-M.P.H. combined program should consult with Dr. Donald Madison, who is the program advisor.

# *Financial Information*[1]

## ESTIMATED EXPENSES

*Tuition*

| Tuition—Semester or Summer (Based on instructional unit) | *N.C. Resident* | *Non-Resident* |
|---|---|---|
| A. Semester | $535.00 | $1,754.00 |
| B. Elective, per unit (4 weeks) | $153.00 | $ 501.00 |
| C. Clerkship per unit (6 weeks) | $150.00 | $ 491.00 |
| D. Clerkship per unit (12 weeks) | $310.00 | $1,018.00 |

*Fees*

| | | |
|---|---|---|
| A. Fall or Spring semester | $145.25 | $ 145.25 |
| B. Summer only registrations | | |
| 1. 4 weeks | $153.00 | $ 501.00 |
| 2. 6 weeks | $150.00 | $ 491.00 |
| 3. 12 weeks | $310.00 | $1,018.00 |

Tuition and fees are due at registration for each semester or summer session. However, the entire amount for tuition and fees is due by the last day of registration. Accounts not paid in full by the last day of registration are subject to a late payment fee and the student's possible disenrollment. Payment may be mailed to the University Cashier, The University of North Carolina, 103 Bynum Hall 008A, Chapel Hill, North Carolina 27514.

### *Living Expenses*

While it is understood that the needs and resources of individuals will vary, the following are considered reasonable living expenses in the Chapel Hill area (including food, rent, clothing, laundry, insurance, ordinary medical/dental expenses, utilities, personal expenses, car and/or travel, etc.): Married students: $800.00 per month; $100.00 per month additional per child. Single students: $425.00 per month.

## ADDITIONAL ESTIMATED EXPENSES

### *First Year*

Books, laboratory manuals, laboratory costs ..... $460.00
Instruments—variable, depending upon microscope cost.
Binocular microscopes will be available to all students at the rate of $50.00 per year. Purchase price varies: $200.00–$600.00
Microscope service fee ..... $50.00
Instruments ..... $375.00

1. The University reserves the right to make, with the approval of the proper authorities, changes in any fees at any time. Tuition rates shown are effective Fall Semester 1983.

*Second Year*

| | |
|---|---|
| Books, laboratory manuals, laboratory costs | $494.00 |
| Instruments | $ 56.00 |
| Microscope service fee | $ 50.00 |

*Third Year*

| | |
|---|---|
| Books, uniforms | $380.00 |

*Fourth Year*

| | |
|---|---|
| Books, uniforms | $200.00 |

Registration and enrollment in this School of Medicine and payment of appropriate tuition and fees will be necessary for courses for which a student wishes to receive credit toward the M.D. degree. This includes clerkships and electives arranged at other institutions in this country or abroad as well as at the School of Medicine in Chapel Hill.

Tuition and fees are due and payable at each enrollment period, summer, fall and spring, at a date which will be announced in the student newsletter. Payments should be made to the University Cashier in Bynum Hall. If any special arrangements are necessary for billing, the student must notify the University Cashier before registration. Accounts which are delinquent will have a late fee added to the bill. If delinquent beyond a certain date, the student may be declared ineligible to continue his or her course of study. University policy prohibits registration for the next enrollment period of any student with an outstanding account.

*Microscopes*

Microscopes owned by the School of Medicine are available for loan to first and second year medical students for a service fee of $50 per year. These microscopes are modern, binocular, four-objective, fully equipped instruments, but without carrying cases. A microscope is reserved for each entering student and will be issued during Registration upon payment of the fee. It is advantageous for most students to use the School-owned miscroscopes, and the School does not recommend that students purchase a personal microscope at this time.

If a student wishes to use a personal microscope it must be inspected and approved. Microscopes should be brought to Room 314 Berryhill (Basic Medical Sciences Building) at the earliest possible date after acceptance. If possible, do not purchase a microscope prior to its inspection.

## FINANCIAL AID

The Medical School Student Aid Committee, with the approval of the Dean, is responsible for recommending students for scholarships and loans. The Student Aid Officer of the School of Medicine is available by appointment at 126A MacNider Hall to discuss financial matters with students throughout the year. The Director of Student Aid at The University of North Carolina at Chapel Hill, 300 Vance Hall, 057A, P.O. Box 1080, Chapel Hill, N.C. 27514, is responsible for the entire student financial assistance program at the University. Additional financial counseling is available at the Student Aid Office.

The University of North Carolina at Chapel Hill has long upheld a tradition of helping individuals of modest financial means to reach their full potential by completing their education. Continuing with this tradition, financial assistance is available in a variety of forms at the Medical School of the University to supplement funds provided by family, from savings, and through the student's summer work. No qualified student who sincerely de-

sires a medical education and who has documented financial need should hesitate to apply for aid.

To qualify for financial assistance, the applicant must be a full-time medical student in good standing and registered in the School of Medicine of The University of North Carolina at Chapel Hill. Any student taking more than 50 percent of the full academic load for credit during the fall or spring semester will be considered a full-time student for that semester. Any student taking 50 percent or less of the full academic load for a semester will be considered a full-time student only for the time he is taking work for credit, i.e., a student who is taking one or two electives for credit during a semester will be considered a full-time student only during the time he is taking those electives and would be eligible for aid only during that period of time. A student, however, taking three electives for credit in a semester would be considered a full-time student for the entire semester and aided fully for the entire semester. In the summer enrollment period a student eligible to receive aid will be considered a full-time student only during the time he is taking Medical School work for credit and will receive aid only during that period of time.

The need for financial assistance must be demonstrated. Financial need of an applicant, whether married or single, will be determined by evaluation of the total resources available to him. The applicant and his family are expected to assist all they can from personal resources. Applicants will be required to document their unusual expenses. Although it is obvious and understood that each budget will vary and will have to be assessed on individual merit, the University has established what it considers reasonable figures for living expenses in the Chapel Hill area for both married and single students and any budget exceeding these figures must be justified by a written description of unusual circumstances.

Funds needed to repay existing obligations outside of the ordinary academic and subsistence expenses cannot be made available through University resources.

If a student receives funds from a source outside the University and also expects to receive University financial aid, the student must apply these outside funds to educational expenses accepted by the University.

A student is "in good standing" if a student has satisfied the requirements for enrollment and is enrolled.

Definition of normal progress. Unless a longer period is specifically approved by the Dean in an individual case, a student is considered to be making "normal progress for purposes of financial aid" if, at any time upon the evaluation of the student's record by appropriate University officials, the student remains able to complete thereafter the requirements of the M.D. degree within a total period of 6 academic years and 4 summer sessions of course work. This time is determined to begin with the first day of classes of the semester in which the student entered medical school. This does not mean that the student must complete the requirements of the M.D. degree without interruption. A student in good standing could, with the approval of the appropriate officials of the University or Medical School, be given a leave of absence for a period of time not to exceed two calendar years and could return at the conclusion of such a leave of absence and complete the work. A student may be able to withdraw from a course if given appropriate permission to do so, receive an Incomplete on one or more courses or a longer period of work, participate in required or voluntary remedial or tutorial activity, repeat a course or a longer period of work (such as an academic year) and still be eligible to receive financial aid provided the student remains able, at the time any of these activities are taking place, to complete the requirements for the M.D. degree within the total time period defined above.

The stated timeframe of 6 academic years and 4 summer sessions should in no way be construed as limiting in any way the Promotions Committee's prerogative to recommend to the Dean dismissal, remedial work, or other

appropriate actions at any time during a student's period of enrollment in Medical School, even if it would otherwise be possible for a student to complete the requirements of the M.D. degree within the stated total time.

Where fitting, a period of time longer than 6 academic years and 5 summer sessions may be considered as making "normal progress" for those students pursuing a combined MD-Other Graduate Degree program in the medical school. Because of the variability of the educational requirements in these different graduate degree programs, the exact length of time that will be allowed for the student to complete his/her particular combined degree program and still be considered as making normal progress will have to be determined on an individual basis by the appropriate University officials.

## EMPLOYMENT

Part-time work by medical students during the school year is generally discouraged, except on a very limited scale, although there are numerous opportunities for summer jobs and research. Information about summer jobs at other locations is available upon inquiry of the Student Aid Office in the School of Medicine.

## FEDERAL SERVICE AWARDS

The largest single sources of direct assistance to medical students at present are the two federal service awards. The National Health Service and the Armed Forces scholarships are awarded by the Federal Government to medical students who obligate themselves for a minimum of two years of specified service after completing their medical training. The programs provide a monthly stipend plus payment of full tuition and fees for students while in medical school. (At present these projected stipends for next year are $556.00 per month for the National Health Service Scholarship program and $556.00 per month for the Armed Forces program.) After medical training is completed, the recipients perform professional services in the public health sector or the military services at appropriate salary for the Civil Service level or military rank. Prospective applicants are urged to consider carefully the long-range effect of the required service obligation. Applications are not available at the Student Aid Office of the School of Medicine for the National Health Service Scholarship Program or military programs. Students interested in these programs should write to the respective services.

## PROCEDURE FOR APPLYING FOR FINANCIAL AID

The necessary forms for application for financial assistance and instruction for their submission may be obtained from: Medical School Student Aid Office, Room 126-A, MacNider Hall, 202H, UNC School of Medicine, Chapel Hill, North Carolina 27514.

The same application forms will be submitted for both loans and scholarships (grants-in-aid) and all students who apply will be considered for both types of assistance.

DEADLINES—All students who anticipate that they will need financial assistance during an academic year should have their applications filed with the Medical School Student Aid Office, by March 1, for consideration for summer and/or academic year awards. Late applications will be accepted if circumstances make it impossible to submit an application prior to the deadline or if unexpected need arises at a later date. Late applications will be processed after the on-time applications if funds are available.

A statement advising disposition of each application will be forwarded to the applicant as soon as possible, usually sometime during the summer. A summer address, therefore, should be included in the application and the

Medical School Student Aid Office should be advised on any change of this address.

## LOANS

Loan funds are available from the following sources:

*The University Student Aid Office.* To students who can qualify on the basis of need, the University offers extended loans under very favorable terms. Under the provisions of the Health Professions Education Assistance Act of 1976, when exceptional financial need can be shown, students may borrow up to $2,500.00 per year plus cost of tuition. Repayment extends over a 10 year period with monthly payments and a low interest rate.

In addion to funds made available by Federal appropriations, the following loan funds are under the supervision of the University Student Aid Office and are available to medical students:

*The Kellog Loan Fund.* Through the generosity of the W. K. Kellog Foundation, a sum was granted the School in 1942 to be used for scholarships and loans to needy medical students; the scholarship fund has been exhausted. The loans from this fund are made on the basis of need, character, and scholastic attainment.

*The Lynn McIver Medical Students Fund.* (Established in 1959). The will of Elva Bryan McIver provided for the sale of a farm in Lee County to establish a loan fund in memory of her late husband, Dr. Lynn McIver, Medical Class of 1899, to be used by worthy, deserving students of good character in the School of Medicine.

*The Dr. and Mrs. Edgar B. Jenkins Student Loan Fund.* This loan fund for medical students was established in 1965 by a gift from Dr. and Mrs. Jenkins, alumni of the University of North Carolina, and will be used to assist worthy students in financing their education.

*College Foundation, Inc. — Federally Insured Student Loan.* The College Foundation, Inc. (CFI) in Raleigh, North Carolina administers this federally insured guaranteed loan for in-state students. A student may borrow up to $5,000 per year at 8% if first time borrower and if loan is requested after September 13, 1983. The interest rate for renewal applicants will remain at 7% if their first loan was awarded prior to January 1, 1980. Other renewal applicants will receive loans at 9%. The aggregate loan maximum is $25,000.

Students qualify as dependent or independent applicants based on family income of the previous year. Eligibility is automatic if the income is $30,000 or below. If income is above $30,000, the size of the family and number in college determines eligibility. Payments are deferred when borrower is engaged in several specific activities, including internships, for a fixed period of time. The promissory note details deferments.

Students must write to College Foundation to request an application. The address is College Foundation, Inc., 1307 Glenwood Avenue, Raleigh, NC 27605.

DEADLINE FOR APPLICATIONS — MAY 30, 1984 FOR 1984-85 SCHOOL YEAR.

*The National Direct Student Loan (NDSL) Program* is for students enrolled at least half-time in a participating post secondary institution and who need a loan to meet their educational expenses.
Provisions of the National Direct Student Loan Program:

1. A student may borrow up to a total of $12,000.00 for professional or graduate study. (This total includes any amount borrowed under NDSL for undergraduate study.)
2. The student may be allowed up to 10 years to pay back the loan, with a 6 month grace period. During the repayment period, the student will be charged a 5% interest on the balance of the loan principal. Repayment is deferred when the borrower is engaged in several specified activities, including internships, for a fixed period of time. The promissory note for NDSL details deferments.
3. Generally NDSL's are limited to $3,000.00 or less per year because of amount of funds available.

*The Student Loan Program for Health, Science and Mathematics.* The purpose of the student loan program is to provide financial assistance to North Carolina residents who demonstrate need as determined by the board. Loans are available for study in the medical fields, mathematics and science programs that lead to a degree. A specialized course of study, internship or clinical affiliation qualify only if it is a requirement for the degree. Financial need is a consideration and loans are not available for partial academic year less than full-time enrollment, repeating academic work previously supported by the student loan program funds except where such coursework is being carried concurrently with full-time coursework in the succeeding class.

The application form and supporting information must be received by the student loan office by not later than 60 days from the date the application packet is mailed to the student with the exception of the certification of admission or promotion, whichever is applicable. Applicants will be notified of the student loan program's decision not later than 60 days following completion of the application.

The maximum amount for each full academic year is $6,000 for students pursuing a doctoral degree. The total maximum is $24,000 for four years.

If you are interested in this loan program, please contact the Student Loan Program, 116 West Jones Street, Raleigh, NC 27611. Telephone: (919) 733-2164.

*Note:* Since there are several other loan programs that offer better terms, this program should be considered only as a last resort.

*The Clarke-Luther Medical Student Emergency Loan Fund.* This fund was established in August, 1979, by Mr. and Mrs. C. Lee Clarke and other members of the Clarke and Luther families. These funds will be used for short term loans to medical students who are in need of emergency assistance. The maximum loan a student may carry at any one time is $300.00.

*The Medical Parents' Emergency Loan Fund.* The Medical Parents' Club of The University of North Carolina at Chapel Hill has established a fund to be used as an emergency loan fund for students of medicine. The loans are short-term and the maximum loan a student may carry at any one time is $300.00.

*The Jim Baker Loan Fund.* This student loan fund was established in July 1955 in appreciation of Dr. Charles B. Mangun and Dr. William deB. MacNider and in honor of James Daniel Baker, the father of Dr. Lenox D. Baker. Dr. Baker was a student at the Medical School of The University of North Carolina in 1930–1931.

*The Sama Lea Mendota-Russel F. Staudacher Revolving Loan Fund.* This fund offers students the opportunity to borrow money in amounts up to $100.00, with interest for a period of three months.

The Medical School Student Aid Office also advises students on other sources of financial aid that are available, including private agencies.

## SCHOLARSHIPS

The majority of medical school scholarships are essentially grants-in-aid and are awarded primarily for financial need. The number of these scholarships awarded and the amount of an individual award will depend upon the funds available, the need of the individual applicants, and the number of applicants qualifying for financial assistance.

Funds for these scholarships originate from the following sources:

1. Alumni gifts to the Medical School;
2. Individuals and families who have established scholarships;
3. Foundations and business firms;
4. General scholarship funds of The University of North Carolina at Chapel Hill;
5. Federal funds for the Exceptional Financial Need Scholarships for first year students.

All medical school classes are eligible to receive financial assistance from grants-in-aid scholarships. These scholarships, however, are not intended to be used as the sole means of financial help and in general the eligible student needing financial aid will be expected to apply for loan assistance as well.

When an award has been made, the recipient will be notified by letter and checks will be issued to individual students at the University Student Aid Office, 300 Vance Hall, 057A, on the two weekdays (Monday–Friday) immediately prior to the first regular day of University classes in each semester.

Renewal of awards is not automatic from year to year, and a renewal application must be submitted each year by the deadline prescribed.

The Exceptional Financial Need Scholarship for the First Year Students was authorized by Congress in 1976 and funded for the first time in 1978–79 school year. The scholarship provides full payment of tuition, fees and books, plus a generous 12 month stipend for first year only. Recipients are chosen from those first-year applicants for financial aid who document exceptional need. Only a very small number of those scholarships are available each year depending upon funds appropriated by Congress.

*The W. Reece Berryhill Mecklenburg Medical Scholarship* was established in 1971 by the UNC Medical Alumni and Friends of Mecklenburg County to honor Dr. W. Reece Berryhill, Dean Emeritus of the School of Medicine and Sarah Graham Kenan Professor of Medicine. The scholarship commemorates Dr. Berryhill's birthplace in Mecklenburg County, and in selecting a recipient, first priority will go to Mecklenburg area residents.

*Board of Governors' Medical Scholarship.* Minority and disadvantaged students admitted to the School of Medicine are eligible to participate in the Board of Governors Medical Scholars Program. Those students who are selected receive annual stipends of $4,000 plus tuition and fees. Recipients must be residents of North Carolina who are enrolled in the School of Medicine on a full-time basis and who demonstrate financial need.

*The Mark R. Braswell Medical Scholarships* were established in 1966 in honor of Dr. Mark R. Braswell, Medical Class of 1884, of Rocky Mount, North Carolina. These scholarships are to be awarded annually to worthy medical students who have financial need.

*The Pat and Kathryn Brown Scholarship* was established in 1970 through a bequest from A. Pat Brown of High Point, North Carolina, to provide scholarship aid to qualified students attending The University of North Carolina at Chapel Hill School of Medicine.

*The Charles H. Burnett Scholarship* was established in 1967 by The University of North Carolina Medical Parents' Club to honor Dr. Charles H. Burnett, the first Chairman of the Department of Medicine in the four-year

school and former Professor of Medicine. The scholarship is awarded annually to an entering medical student on the basis of merit and need.

*Carolina Country Family Medicine Scholarship* was established in July 1975 by James A. Chaney, editor of the "Carolina Country Reader," in conjunction with the Moore Publishing Company of Durham, N.C. The purpose of this scholarship is to encourage medical students to become family doctors serving rural patients.

*The Edwards Distinguished Scholarship* was established in 1983 by members of the Edwards and Hobgood family. This scholarship is based on academic merit and provides support for four years. Continuation of this scholarship is dependent upon satisfactory academic performance.

*The Kenneth Raynold Edwards and Alfred Llwellyn Hobgood, Jr. Scholarship Fund* was established in 1963 by Mr. Kenneth R. Edwards, before his death, a resident of Richmond, Virginia, and formerly of Henderson, North Carolina, to help worthy young men and women who would be unable to pursue a medical education at The University of North Carolina without financial assistance.

*The Dennis Luther Fox Memorial Scholarship* was established in 1953 through a gift to the Medical Foundation of North Carolina, Inc. by Dr. Dennis Bryan Fox, Medical Class of 1935, of Elkin, North Carolina, in memory of his uncle, Dr. Dennis Luther Fox, who practiced medicine for over fifty years in Randolph County. According to the donor, "the recipient of the scholarship should be a resident of North Carolina, of good moral character and should have manifested satisfactory scholastic ability."

*Dr. Herbert H. Fritz Special Merit Award Fund* was established in 1983 by the widow of Dr. Fritz in his memory. This award is based on academic merit and will be awarded each year to a medical student.

*The Doctor William Hunt Hall Memorial Scholarship* was established in 1959 by the will of the late W. Hunt Hall, Jr., of New York City, in the memory of his father, Dr. William Hunt Hall, Medical Class of 1855, a Confederate veteran and a practicing physician of New York City. According to the provisions of the bequest contained in Mr. Hall's will, "the trustees are directed to allocate the income from the principal to be used by the said Trustees of The University at Chapel Hill for the medical education of worthy students who, in their judgment, are in need of financial assistance."

*The John D. Idol Memorial Scholarship Fund* was established in 1976 through the bequest of John D. Idol of the class of 1934. The funds are to be awarded to worthy students in the School of Medicine and the School of Religion.

*Home Savings and Loan Association Scholarship* was established in 1960 by the Home Savings and Loan Association of Durham and Chapel Hill, North Carolina, for worthy and needy students of medicine.

*The Mrs. Augustus H. Jones Scholarship* was created in 1930 by Mrs. James H. Parker of New York City. The recipient of this scholarship is to be designated by Mrs. James H. Parker during her lifetime and thereafter upon the recommendation of the New York Chapter of the United Daughters of the Confederacy. Failing this recommendation from either source, appointment is to be made by the President of the University, preference being given first to the relatives of the late Dr. James H. Parker of New York, and second to the relations of the donor.

*The James Craig Joyner Foundation Scholarship Fund* was created in 1961 by a gift from the James Craig Joyner Foundation of New York City, and in 1972 was significantly increased by a second gift from the James Craig Joyner Foundation. Dr. James Craig Joyner enrolled in the University from

Princeton, North Carolina, and entered the School of Medicine of the University in 1914.

*The Sarah Graham Kenan Scholarship Fund* was established in 1975 to honor the memory of Sarah Graham Kenan of Wilmington, North Carolina and to provide financial assistance to worthy students in the School of Medicine.

*The Kennedy Scholarship* was established in 1960 with the help of Dr. Edward C. Curnen, Jr., former Professor of Pediatrics in the School of Medicine, from a bequest by the late Robert S. Kennedy, an old family friend of Dr. Curnen. The scholarship is awarded annually in memory of Mr. Kennedy's sister, Margaret Jane (Kennedy) Osborne; his brother, Maxwell Kennedy, and Robert S. Kennedy.

*The Dr. W. Lunsford Long Jr. Scholarship* was established in 1963 through contributions from many of his friends, in memory of the late Dr. Long, Medical Class of 1942, a practicing physician in Raleigh, and member of the faculty of The University of North Carolina School of Medicine.

*The Dr. John A. Lowder Memorial Scholarship* was created in 1961 by Mr. and Mrs. S. Ray Lowder, of Lincolnton, North Carolina, in memory of their son, Dr. John A. Lowder, Medical Class of 1956. The income from the Memorial Fund established within the Medical Foundation of North Carolina, Inc., by Dr. Lowder's classmates, friends, and family is used for annual scholarship to a deserving and needy student in the School of Medicine.

*The L. P. McLendon Scholarship* was established in 1968 through a bequest from Major L. P. McLendon, Law School Class of 1912, and gifts received by the Medical Foundation of North Carolina, Inc., in memory of Major McLendon. The income is awarded yearly to a deserving medical student, preferably from the Counties of Durham, Guilford, Orange, or Anson.

*The Charles S. Mangum and Charles S. Mangum, Jr. Scholarship* was established from the estate of Charles S. Mangum, Jr. in accordance with his will dated November 15, 1972. One-half of new income from this trust shall be used for scholarships by the School of Medicine and the remaining half shall be used for scholarships by the School of Law.

*The Isaac Hall Manning Scholarship Fund* was established by John T. Manning, Dr. Isaac H. Manning, Jr., and Howard E. Manning, Alumni of The University of North Carolina, in memory of their father, Dr. Isaac Hall Manning, Medical Class of 1895 and Dean of the Medical School 1905–1933. The Fund was significantly increased in 1974 by a gift from the Sarah Graham Kenan Foundation. The income from the fund is awarded annually to a student in the School of Medicine of The University of North Carolina on consideration of scholarship and need.

*The C. Knox Massey Medical Scholarship* was established in 1964 by Mr. C. Knox Massey, Undergraduate Class of 1925, in memory of Mr. Massey's father, C. W. Massey, Undergraduate Class of 1888, and Mr. C. T. Council, Pharmacy Class of 1907. The Scholarship is awarded to a worthy medical student, preferably from Durham County.

*The George Holliday McLeod Scholarship* was established in 1983 by members of the McLeod family in memory of George Holliday McLeod. The funds are to be awarded to a deserving entering medical student who has committed himself to study at The University of North Carolina School of Medicine.

*The Minority Presence Grant Program for Doctoral Study* provides stipends of up to $5,500 for the academic year, with an option of $600 in additional support for study in the summer session, for black residents of North

Carolina who are selected to participate. Recipients must be full-time students pursuing doctoral degrees at The University of North Carolina at Chapel Hill.

*The Minority Presence Scholarships* are granted from funds allocated by The University of North Carolina for the purpose of assisting needy black students at The University of North Carolina at Chapel Hill. Under the Board of Governors General Minority Presence Grant Program black students may be eligible for special financial assistance if they are residents of North Carolina, enrolled for at least three hours of degree credit coursework, and demonstrate financial need.

*The New York Life Insurance Company's Scholarship Program* was announced in 1966, and The University of North Carolina School of Medicine is one of the institutions in the United States and Canada selected to participate. The program is designed to assist qualified men and women in completing their medical studies.

*The North Carolina Academy of Family Physicians Memorial Scholarship Fund.* Funds are available to make loans and a limited number of scholarships to help defray educational expenses of worthy medical students selected by the trustees of the fund. Preference is given to those students who have demonstrated an interest in pursuing a career in Family Practice.

Any student enrolled at an accredited medical school located within the State of North Carolina is eligible to make application to the Trustees requesting financial assistance in meeting educational expenses incurred in connection with continuance of his or her medical education. The Trustees will review all such applications and select the recipients.

Inquiries should be directed to the Executive Director, North Carolina Academy of Family Practice, 1002 Wake Forest Road, Raleigh, North Carolina 27604.

Applications are available in the Medical School Student Aid office.

*The Medical Student Wives Association Scholarship* was awarded for the first time in 1964. It is the intent of the medical student wives to continue this annual gift from proceeds from their service projects.

*The North Carolina National Bank Scholarships* were created in 1960 through a gift to the Medical Foundation of North Carolina, Inc., by the bank in Chapel Hill. These scholarships are awarded annually to worthy and dedicated students in the School of Medicine.

*Dr. William Jennings Bryan Orr Memorial Scholarship* was established in 1977 from contributions and gifts from various donors in memory of Dr. William Jennings Bryan Orr who attended the School of Medicine from 1915 to 1917. The scholarships are for pre-med or medical students preferably from eastern North Carolina.

*The John R. Paddison Student Aid Fund* was established in 1967 by a bequest from Dr. John R. Paddison, Medical Class of 1900, as an expression of appreciation to the members of the Medical School faculty of The University of North Carolina and particularly as an expression of high regard for Dr. Richard Whitehead, Professor of Anatomy and Dean of the Medical School 1890–1905, and Dr. Charles S. Mangum, Professor of Anatomy and Dean of Medical School 1933–1937. The income from the fund is awarded yearly as a scholarship to a medical student who is in need of financial assistance and is a resident of North Carolina.

*The Parker Scholarship* was established in 1930 by a gift of Mrs. James Henry Parker, through the James Parker Chapter of the New York Division of the United Daughters of the Confederacy, in memory of her husband, the late Dr. James Henry Parker. The award is made annually upon recommen-

dation of Mrs. Parker during her lifetime, and thereafter upon recommendation of the New York Chapter of the United Daughters of the Confederacy. In default of recommendation from either of these sources, the President of the University may designate the recipient.

*The Dr. Oscar L. Sapp Memorial Scholarship Fund* was established in 1981 in memory of Dr. Oscar L. Sapp, Class Advisor, by Drs. F. Daniel Jackson and Elizabeth H. Jackson of the Medical Class of 1973. This scholarship is awarded to a rising fourth year medical student who has completed the clinical work of the third year and who also has demonstrated financial need.

*The Dr. Eli R. Saleeby Fund* was established in 1966 by Dr. Saleeby, Medical Class of 1920. The income from the fund may be used at the discretion of the Dean for student aid.

*The Sigmund Sternberger Scholarships* were established in the School of Medicine of The University of North Carolina in 1970 in the form of an annual gift from the Sigmund Sternberger Foundation, Inc., of Greensboro, North Carolina. The late Sigmund Sternberger was a prominent industrialist associated with Cone Mills Corporation engaged in textile manufacturing in Greensboro. He was one of the leaders in the civic, religious, and cultural activities of Guilford County and was deeply devoted to assisting persons in the community who but for his help would not have otherwise been able to realize their full potential. The scholarships are awarded to deserving students who are residents of North Carolina and who are genuinely interested in practicing medicine in the state.

*Louis Nelson West and Betsy John Haywood West Scholarship Fund* was established under the will of Betsy John Haywood in 1976 to be used for scholarships for a person or persons attending the Medical School or for a person majoring in the field of mathematics at The University of North Carolina at Chapel Hill.

*Womack-Whitson Foundation Scholarships* were established in 1983 as merit scholarships to provide payment of tuition for four years for two students each year at the University of North Carolina School of Medicine. The recipients are selected by the Womack-Whitson Foundation. Continuation of the scholarship beyond the first year depends on the maintenance of an acceptable record of performance in the medical school.

*The Dr. Thomas Woodfin Sumner Memorial Scholarship Fund* was established through a bequest by Mrs. Grace A. Sumner, who died August 19, 1973, in memory of her husband, Dr. Thomas Woodfin Sumner, of Hendersonville, North Carolina. He attended the School of Medicine in 1906–1908 and dedicated 50 years of his life to the practice of medicine.

*The Dr. John Cotton Tayloe Scholarship*. Bearing the name of a loyal alumnus, Medical Class of 1920, active Trustee and long-time friend of the University of North Carolina, this scholarship was made possible by a bequest to a Medical Foundation by Dr. Tayloe and was awarded for the first time in 1964.

*The Isaac M. Taylor Scholarship* was established in 1971 by the University of North Carolina Medical Parents' Club to honor Dr. Isaac Montrose Taylor, Dean of the School of Medicine from 1964 to 1971. The scholarship is awarded annually to a medical student on the basis of merit and need.

*The Adam Thorp Memorial Scholarship* was established in 1960 in memory of Dr. Adam Thorp, Medical Class of 1919, of Rocky Mount, North Carolina, by a group of his friends in eastern North Carolina through contributions to the Adam Thorp Memorial Fund of the Medical Foundation of North Carolina, Inc. Dr. Thorp was president of the Alumni Association

during the period 1956–57. The scholarship is awarded to worthy students of medicine in financial need.

*The Dr. Hillory M. Wilder Scholarship Fund* was established under the will of Mrs. Celeste W. Blake in memory of her father, Dr. Hillory M. Wilder of Charlotte, North Carolina, Undergraduate Class of 1846. Beginning in 1963, the income from this endowment has been used for scholarships to aid students in need of financial assistance in the pursuit of study for the medical profession. The dominant purpose in awarding these grants is to "produce the greatest benefit in the advancement of the science of medicine among residents of North Carolina and the alleviation of human suffering in North Carolina."

## MERIT SCHOLARSHIPS AND FELLOWSHIPS

*The W. Reece Berryhill Scholarship* was established in 1964 by The University of North Carolina Medical Parents' Club to honor Dr. W. Reece Berryhill, Medical Class of 1925 and Dean of the School of Medicine, 1941–1964. This scholarship is a merit award given to a rising senior student and based on excellence of academic performance since entering medical school.

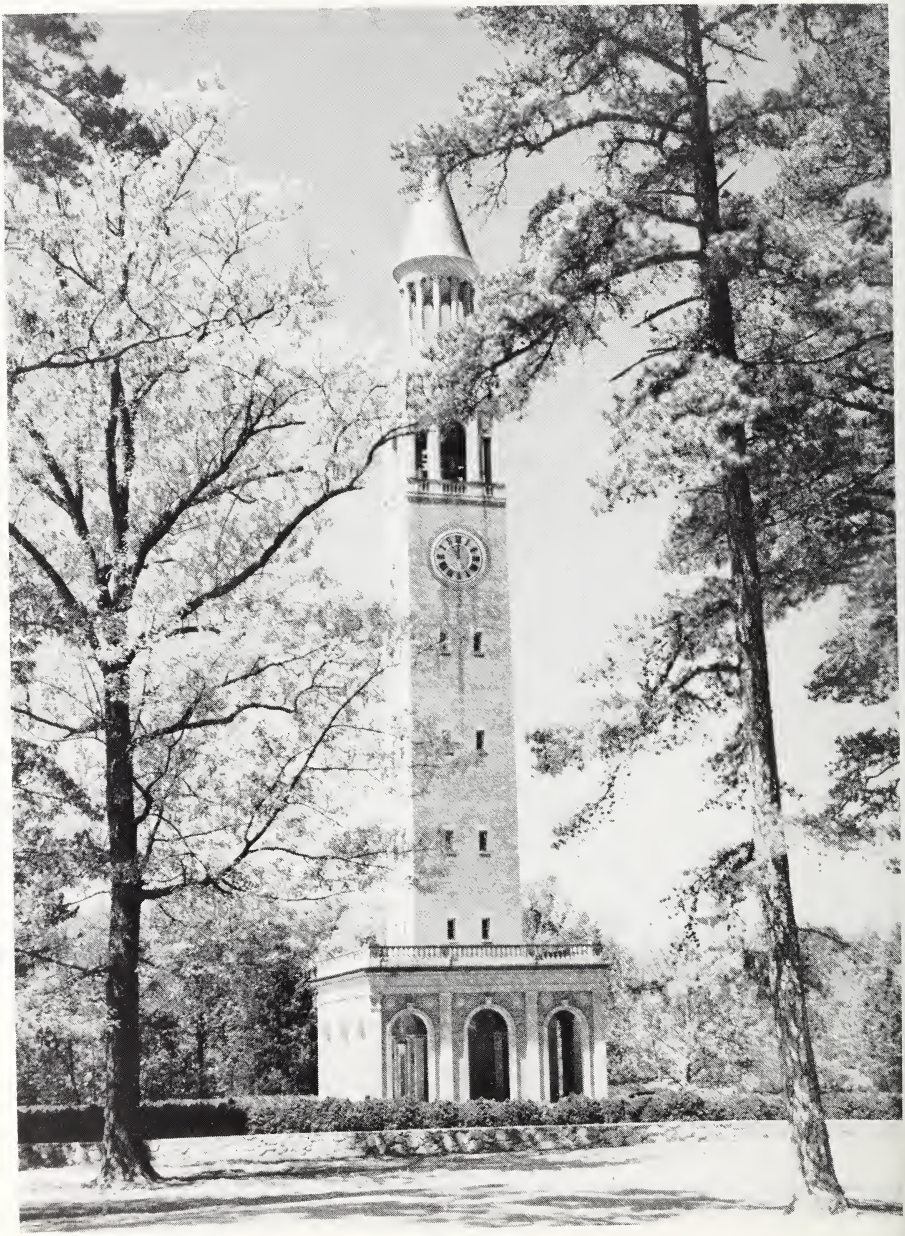
*The Thomas Collum Butler Scholarship* was established in 1982 in honor of Dr. Thomas C. Butler's distinguished service and research career at this University. The scholarship will be used to support candidates in the combined M.D./Ph.D. program. The primary basis for making an award includes merit and potential, rather than need. Recipients of the scholarships will be selected by the Director of the M.D./Ph.D. program with the advice of the Director's Advisory Committee.

The scholarship provides a stipend of $5,000 in addition to $1,300 to offset in-state tuition and fees or partially to offset out-of-state tuition and fees.

*The Howard Holderness Fellowship Program* was established in October 1980 by the Howard Holderness family to provide awards to outstanding medical students that would serve as an incentive and career shaping factor for the students at a stage in their career when they are still uncommitted. The awards will support research effort and scholarly work of the student, and in addition, will be used to cover the cost of travel to other institutions for the purpose of broadening his or her scholarly activities or for the presentations of the results of his or her studies. Under special circumstances the award might be used to purchase laboratory supplies or small items of equipment to support the specific research program of the student. Six students will be selected yearly and each individual award will be $3,000.00. Financial need is not considered. Recipients will be eligible to reapply for renewal on an annual basis. Nominees will be selected by a screening committee appointed by the Dean of the School of Medicine and final selection will be made by the Holderness Fellowship Committee.

*The University of North Carolina Medical Alumni Loyalty Fund Scholarships.* A limited number of these scholarships has been made possible through gifts from alumni and friends of the School of Medicine.

*The Riggins Scholarship* was established through a gift to the Medical Foundation of North Carolina, Inc., by Dr. and Mrs. H. McLeod Riggins, of New York City, to honor Dr. Riggin's younger brother, the late Dr. John C. Riggins. Dr. H. McLeod Riggins was a member of the Class of 1922 of the Medical School of the University of North Carolina. This scholarship is a merit award given to a rising junior student and based on excellence of academic performance since entering medical school.



# General University Regulations and Policies

## ACADEMIC REGULATIONS

In publishing these regulations, the University does not recognize any implied contract as having validity beyond the succeeding academic year. The faculty reserves the right to make changes in curricula and in regulations when in its judgment such changes are for the best interest of the student and the University. Ordinarily a student may expect to receive a degree by meeting the requirements of a curriculum as specified in the catalog currently in force when he first entered the University, or in any one subsequent catalog published while he is a student; but the University is not obligated to fulfill this expectation or to offer in any particular year a course listed in the catalog.

Each student is responsible for observing the procedures, regulations, and requirements of the University and the School of Medicine as they are announced here and in other official University and School of Medicine sources, including the Student Orientation Handbook. It must be emphasized that the staff of the University will gladly assist any student with details of his program or other academic problems, but that such assistance does not relieve any student of his individual responsibility for meeting the requirements and observing the regulations of the University and the School of Medicine.

## THE HONOR COUNCIL

Persons enrolled in the School of Medicine are members of the student body of the University of North Carolina at Chapel Hill, and are responsible for conducting themselves in conformity with the moral and legal restraints found in any law-abiding community. General regulations of the University relating to student conduct apply to all students—graduate, undergraduate, or professional. All students are subject to the regulations of Student Government under the Honor Code and Campus Code.

The medical student body has its own honor council which functions within the framework of the University Student Government and the Student Council. It consists of the Whitehead Council and is chaired by the Vice President of the medical student body.

## NOTICE ON "DIRECTORY INFORMATION" TO ALL STUDENTS OF THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

The University of North Carolina at Chapel Hill has routinely made public certain information about its students. Some typical ways this has been done include the following: names of students who are selected by the various honorary societies, who receive scholarships, who make the Dean's List, who hold offices, or who are members of athletic teams are frequently made public. To facilitate campus communication the University annually publishes the *Campus Directory*. Some professional and graduate school student groups publish directories of students in their departments or schools.

The annual commencement program publishes the names of persons who have received degrees during the year.

The Family Educational Rights and Privacy Act defines the term "directory information" to include the following categories of information: the student's name, address, telephone listing, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student. The University will make public information about each student *limited* to these categories in ways such as those described above. Of course, information from all these categories is not made public in every listing. The *Campus Directory*, for example, publishes only names, addresses and telephone numbers.

Under a special provision of the FERPA regulations, the University will also disclose personally identifiable information from the education records of a student, without the student's prior written consent, to officials of another school or school system in which the student seeks or intends to enroll.

Students who do not wish to have any or all "directory information" made public without their prior consent must notify the Office of Records and Registration, The University of North Carolina at Chapel Hill, of this fact in a signed and dated statement specifying items that are not to be published. This notice must be received by the Office of Records and Registration by the end of the registration period for the semester or session of first enrollment or, after an absence, of re-enrollment, and by the end of each fall registration period thereafter.

## RESIDENCE STATUS FOR TUITION PURPOSES[1]

The following sections summarize important aspects of the residency law. A complete explanation of the Statute and the procedures under the statute is contained in *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes.* This *Manual* and other information concerning the application of this law are available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library.

All students are responsible for knowledge of the contents of the Statute and the *Manual.*

*General.* Every applicant for admission is required to make a statement as to his or her length of residence in North Carolina. The tuition charge for legal residents of North Carolina is less than for nonresidents. To qualify for in-state tuition, a legal resident must have maintained his or her domicile in North Carolina for at least 12 months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the State during such 12-month period was for purposes of maintaining a bona fide domicile rather than for purposes of mere temporary residence incident to enrollment in an institution of higher education. A student seeking classification as a resident for tuition purposes must complete an application for residence status (obtainable at his or her admissions office) and return it to the proper

1. The information in this section comes from three sources: (i) North Carolina General Statutes, Sec. 116-143.1, (ii) *A Manual to Assist the Public Higher Educational Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes,* Revised August 1981, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes.

admissions office. Every student must be classified either resident or nonresident before enrolling. Unless the student supplies enough information to allow the admissions officer to classify the student as a resident-for-tuition-purposes, the student will be classified a nonresident for tuition purposes.

When an enrolled student has applied to be classified as a resident for tuition purposes and receives an institutional request for more information in connection with that application before the end of the term for which classification is sought, the student must respond to that request no later than three weeks after the end of the term. If the student does not receive the request for supplemental information until after the end of the term in question, he or she must supply the requested information within three weeks of receipt of the request. Failure to supply the requested information within the specified time limit will result in a continuation of the student's "nonresident" classification unless good cause is shown for such failure.

*Domicile.* Domicile means one's permanent dwelling place of indefinite duration, as distinguished from a temporary place of abode; the term is synonymous with "legal residence."

*Burden of Proof and Statutory Prima Facie Evidence.* The student has the burden of establishing facts which justify his or her classification as a resident-for-tuition-purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the statute proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence

a. Even if the student is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the student is not a legal resident of North Carolina unless the student has lived in this state the five consecutive years prior to enrolling or re-registering. To overcome this prima facie showing of nonresidence, the student must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.

b. Conversely, if the parents of the student are domiciliaries of North Carolina under the Statute, this fact constitutes prima facie evidence that the student is a domiciliary of North Carolina. This prima facie evidence may also be overcome by other evidence of legal residence. If the student has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

### *Statutory Exceptions*

a. *Grace Period.* If a student has been properly classified as a resident-for-tuition-purposes and, thereafter, his or her state of legal residence changes, the student does not automatically lose the benefit of the in-state tuition rate immediately. Instead the statute provides for a grace period if the following conditions are satisfied:

1. The student must have been properly classified as a resident for tuition purposes, on the basis of a valid finding that the student in fact was a legal resident of North Carolina and had been such for the requisite 12-month period prior to classification;

2. At the time of subsequent change of legal residence to a state other than North Carolina, the student must have been enrolled in a public institution of higher education in North Carolina.

The extent of this grace period (during which the in-state rate is applicable in spite of the fact that the student is not a legal resident of North Carolina) is 12 months from the date of change in legal residence plus any portion of a semester or academic term remaining, as of the expiration date of the 12-month period, in which the student is enrolled.

b. *Qualifying Periods for Spouses.* By virtue of the provisions of G.S.

116-143.1, if a student otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina before the beginning of the term for which resident status is sought, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than 12 months, by reference to the length of the legal residence of the spouse of the student, if the spouse has been a legal resident of the State for the requisite 12 month period.

c. *Reacquisition of Resident Tuition Status.* The prescribed 12-month period of legal residence may also be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and re-established North Carolina domicile within 12 months after abandoning it. Students should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

*Married Persons.* The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of his or her spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

*Minors.* A minor is any person who has not reached the age of 18 years. The domicile of a minor is that of the father. With a few exceptions noted below, this presumption is virtually irrebuttable. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father.

In determining residence status for tuition purposes, there are two exceptions to the above provisions:

1. If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.

If, immediately prior to his or her eighteenth birthday, a person would have been deemed to be a North Carolina legal resident under this provision but he or she achieves majority before enrolling in an institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:

a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and

b. The person must begin enrollment at an institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.

2. If, immediately prior to beginning an enrolled term, the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative, during those years, has functioned as a de facto guardian of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her eigh-

teenth birthday, then, when he or she reaches the age of 18, he or she will be deemed to be a legal resident of North Carolina of at least 12 months' duration.

Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. §7A-717, et seq., he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile in fact has been established.

*Aliens.* Aliens who are permanent residents of the U.S., or who hold a visa which will permit eventual permanent residence in the U.S., are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the United States under a visa conditioned at least in part upon intent not to abandon a foreign domicile (C, D, and M visas) cannot be classified a resident. An alien abiding in the United States under a visa issued for a purpose which is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal resident (C and D visas) cannot be classified a resident.

Possession of certain other immigration documents may also allow an alien to be considered for in-state tuition status. For more details aliens should consult their admissions offices and the *Manual.* Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident-status-for-tuition-purposes.

*Military Personnel.* The domicile of a person employed by the Federal Government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish a domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the State of North Carolina.

*Prisoners.* There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the *Manual.*

*Property and Taxes.* Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for in-state tuition rate.

*Change of Status.* A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual matriculation. In the absence of a current and final determination by the admitting institution that the student is a resident for tuition purposes, relative to the term of initial enrollment or re-enrollment, the student is classified a nonresident for tuition purposes prior to actual matriculation. A residential classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

*Transfer Students.* When a student transfers from one North Carolina public institution of higher education to another, he or she is treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence classification for tuition purposes.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless (1) the affected student requests a reclassification inquiry or (2) the transfer or enrollment occurs

following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

*Responsibility of Students.* Any student or prospective student in doubt concerning his or her residence status must bear the responsibility for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Officer of Admissions of these circumstances in writing. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

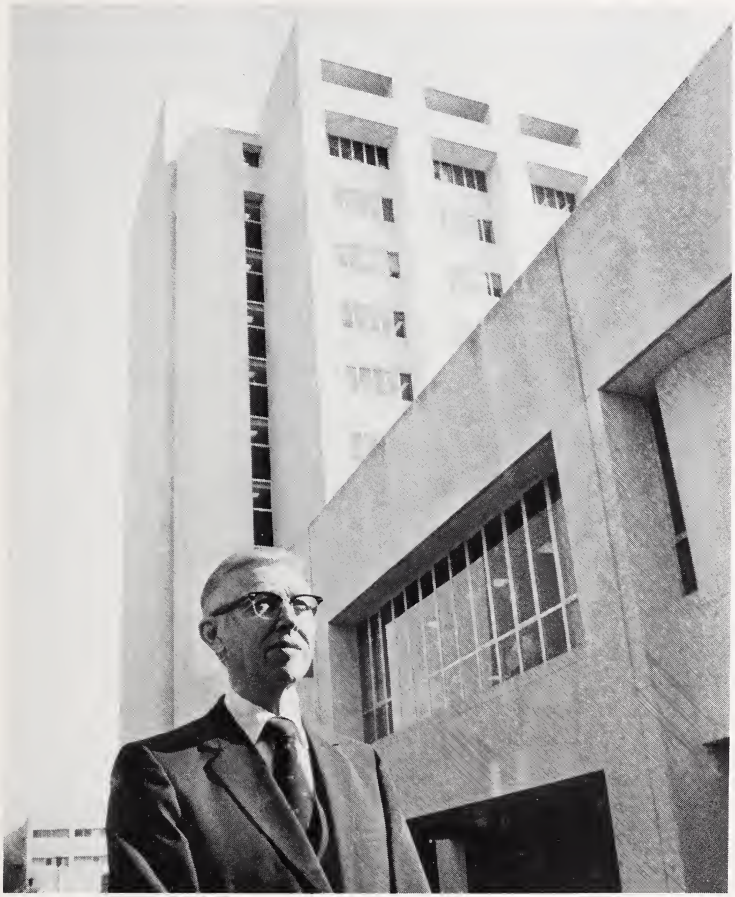
It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified as a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

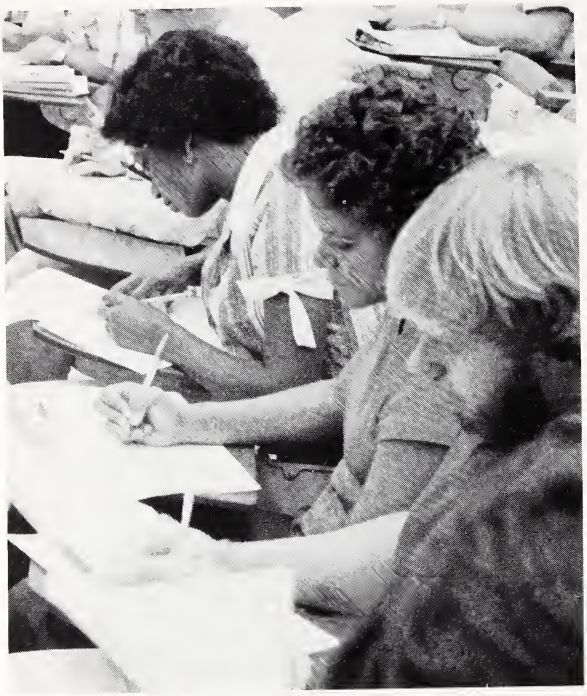
If a student, who has been found to be a nonresident for tuition purposes, receives an erroneous notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

If a student is classified a resident for tuition purposes after submitting falsified residentiary information or after knowingly witholding residentiary information, the student's application for in-state tuition status is fraudulent. The institution may re-examine any application suspected of being fraudulent, and, if warranted, will change the student's residence status retroactively to the beginning of the term with respect to which the student originally made the fraudulent application. If this occurs the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary consequences, including dismissal from the institution.

*Appeals of Rulings of Admissions Officers.* A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within 15 working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded an opportunity to appear and be heard by the Committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact, within ten days of receipt by the student of the Committee's decision, to the Chairman of the Residence Status Committee, and the Chairman promptly processes the appeal for transmittal to the State Residence Committee.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time and that applications for classification should not be delayed until registration, when the number of applications make accelerated handling impossible.





# The Academic Program

## THE MEDICAL CURRICULUM

After a three year period of review in which over 300 students and faculty participated, a new curriculum was approved by the faculty in the spring of 1983. The class of 1988 will be the first to participate in the new curriculum, which will be implemented one year at a time. In the period between 1984 and 1987 two curricula in the medical school will be in place. In the descriptions of second, third, and fourth years that follow essential information on both curricula will be given.

Teaching and learning are essentially human activities and involve day-to-day interactions between faculty and students as they teach and learn from each other. The curriculum provides one environment within which these interactions take place. An overall goal of the new curriculum is the fostering of the excitement, enthusiasm, curiosity, and mutual respect that characterize these interactions at their best.

Some of the principles that shape the new curriculum include:

— Students should be presented with that quantity of facts and concepts that a medical student can reasonably be expected to learn and retain. Not everything can be learned in four years.

— Students should be encouraged to be more active in and responsible for their education.

— The four year curriculum should be coordinated, open to change, and well managed.

— Excellence in teaching should be fostered and rewarded.

— The evaluation system should certify competence, reward excellence, and help to create habits of life-long learning and self-assessment; examinations should not become ends in themselves.

Many concepts of the new curriculum reaffirm and strengthen principles and goals of the faculty as expressed in its Policy Statement (page 1). Dean Bondurant has described the product of the curriculum review in these words:

The recommendations are intended to strengthen the ancient bases of medical education in science, humanism and practical application modulated to be responsive to the personal, social and scientific settings of the next several decades. The recommendations include a reaffirmation of our commitment to be educationally supportive of a heterogeneous and representative student body prominently including members of minority groups. The changes are designed to assure continuing evolution and adaptation of the curriculum in response to changes in society and in health care. The faculty has approved a solid, substantial advance in curriculum design which will doubtless help our graduates to be better doctors in the 21st century.

## RESEARCH AND ACADEMIC ENRICHMENT

The School of Medicine strongly encourages students to carry out research during their medical education. Students should consider delaying graduation by one or two semesters so they can devote full-time to research. A high percentage of students do become involved in research while in medical school, through such means as research electives and summer projects. Students may register for Research 399 when doing research over an extended period. A distinguished group of more than 100 faculty are available to help students develop and carry out projects using the facilities of their laboratories. Funding is provided through a Federal grant for short-term training awarded to the School. Other sources of funds are also available.

Approximately 30 students each year formally present their findings at Student Research Day, a program organized primarily by students. Each year an outstanding scholar is invited to come to Student Research Day, to comment on the individual projects presented and to present a talk to students and faculty. Recent speakers have been Drs. Alvin Feinstein, David Kipnis, and A. McGehee Harvey. All students who participate in Student Research Day become members of the John B. Graham Student Research Society.

Applicants should write to the Office of Student Research, 121 MacNider (202H) for further information including a partial list of faculty mentors who work with student researchers.

## REQUIREMENTS FOR DEGREES IN MEDICINE

*Doctor of Medicine*

Graduation from the School of Medicine with the degree of Doctor of Medicine is dependent upon the completion of the prescribed required and elective curriculum in a manner satisfactory to the Student Promotions Committee, acting for the faculty.

*Doctor of Medicine with Honors*

The degree of Doctor of Medicine with Honors has been established and approved by the Faculty of the School of Medicine. To be eligible for an M.D. degree with Honors a student must meet two criteria: (1) an outstanding academic record; and (2) submission to the appropriate faculty committee of a scholarly paper of superior quality related to some aspect of medicine. The student must be the sole author of this paper. Papers may be submitted to the Committee at any time, but not later than March 1 for May graduation, August 1 for August graduation, and December 1 for December graduation.

*Bachelor of Science in Medicine*

Eligibility for the Bachelor of Science in Medicine degree is dependent upon (a) admission to The University of North Carolina School of Medicine, (b) completion of specific undergraduate courses with at least the third year of preprofessional work at The University of North Carolina at Chapel Hill, and (c) evidence of satisfactory completion of the prescribed curriculum of the first year of Medical School. This degree is awarded by the College of Arts and Sciences.

*Academic Record*

A complete academic record is maintained by the Office of the Dean on each student registering in the School of Medicine. Reports of performance, certifications of enrollment, and letters of recommendation are supplied upon request of the student without charge for applications for training, licensure, etc.

A student will have appropriate access to his or her record upon request with the right to challenge the accuracy of the information contained therein.

## EVALUATION OF STUDENT PERFORMANCE

The students in the School of Medicine are highly selected and the expectation of the faculty is that all students who enter should be able to complete successfully the requirements for the degree of Doctor of Medicine. Certain certifying standards must be met and the evaluation system outlined is intended to accomplish this end.

Acceptance of the regulations and policies adopted by the Faculty is assumed with registration.

*First Year (The New Curriculum)*

The new evaluation plan is based on the premise that the way students are examined is a major determinant of the way they study, how they learn, and their attitude toward their education. The goals of the curriculum are to build problem-solving and communicative skills and to develop habits of self-assessment and continual learning that will remain with the physician throughout his or

her professional life. Examinations should reflect these broad goals of the curriculum.

The evaluation system for first year students entering in the fall of 1984 is based on the following principles:

(1) the honors, pass, fail grading system will be retained;

(2) students will be tested with a number of formats such as short answer and essay so that they can demonstrate knowledge beyond fact recall;

(3) the teaching aspect of examinations will be emphasized, and the Associate Dean for Academic Affairs will monitor the curriculum for any tendency toward overexamining students;

(4) faculty-designed examinations, closely related to course content, will replace many National Board subtests presently used in several courses;

(5) students must pass every course; tutorials, a summer program, reexamination and a decelerated program will be options for students having academic difficulties; for advanced students testing for exemption from selected basic science courses is offered;

(6) a Promotions Committee, composed of faculty members actively engaged in teaching, will apply the standards established by the faculty and specifically expressed by the faculty in each course.

*The Second-Fourth Years (Present Curriculum)*

The aims of the faculty in establishing the examination system described below are to enhance the scholarly atmosphere of the School by encouraging the student to take most of the responsibility for his or her continuing study and to eliminate examination as the motivation for study.

Each course director is expected to transmit to the student the general objectives of the course, the teaching methods and the evaluation procedures which will be used.

Each course director is asked to submit qualitative reports on individual student performance to the Student Promotions Committee. As a basis for this qualitative evaluation, instructors may use information derived from small group discussions, and personal interaction with students.

Directors and faculty of courses in the second year of the curriculum have the option to give in-course examinations for the purpose of evaluation of student performance in the course and to assess the effectiveness of instruction. The maximum examination time permitted for each course is 1.5 hours of examination for each 45 contact hours of instruction. Those courses having less than 45 contact hours of instruction in the curriculum have a maximum of 1 hour

for examination. The Educational Policy Committee monitors (a) the number of in-course examinations and the total time devoted to in-course examinations for each course, and (b) the scheduling of examinations so that an appropriate interval is maintained between examinations in the various courses.

At the beginning of each academic year, students in the first and second years of the curriculum are randomly assigned a confidential code number by the Dean's office. The student uses the assigned code number instead of name on all in-course examinations. After each examination, the director of the course may request the name of each student who did not achieve a passing score for the examination as determined by the faculty of the course. The names of these students are given to the course director and the class advisor for purposes of counseling and aiding the students.

The Promotions Committee has access to data from in-course examinations for their deliberations concerning students (a) who are being considered for honors for the year and (b) whose overall yearly performance (based on comprehensive examinations and subjective comments) is in question.

Students may also be given the opportunity for self-evaluation of performance during the year by optional quizzes in which they are not identified by name. These quizzes are in addition to the in-course examinations given to all students.

*Final Examinations.* Faculty examinations committees are responsible for the development, administration, grading and analysis of the year-end examination(s). A single examination covering the subjects taught in each year may be given or a group of examinations, each representing one or more of the subjects taught, may be utilized. The Committee also may elect not to administer an examination in a particular subject. A total score for the entire examination(s) for each student is reported to the Student Promotions Committee.

*Grading System.* The Student Promotions Committee acting for the faculty has the responsibility for assigning an overall grade for the entire year's work to each student. This grade is determined by a review of the student's total performance, final examination scores and their analysis by the Examinations Committee, and any additional relevant material. The final examination scores will serve as only one criterion for the grade and may be overridden in either direction by other available information.

The grade awarded to the student is a single notation of Honors (H), Pass (P), or Fail (F) for the year's work and is the only grade recorded on the Medical School transcript for future certification needs. This grade is made known to the student, and the final examination numerical score is also available to him or her upon request. Students are not ranked academically.

The grade of Honors (H) is given when, in the opinion of the Promotions Committee, the student's overall performance for the year

merits special commendation.

The grade of Pass (P) is given when, in the opinion of the Promotions Committee, the student's overall performance for the year is acceptable and satisfactory. Remedial action may be required in a specific area(s) if educational weaknesses are revealed during the Promotions Committee's evaluation of the student.

The grade of Fail (F) is given when, in the opinion of the Promotions Committee, the student's overall performance is unsatisfactory and unacceptable.

The Student Promotions Committee may give temporary year-end grades which will convert to permanent grades within a specific time period on a case by case basis according to the following rules: A grade of condition (CO) is given for students not clearly passing or failing; it may be converted by removal of deficiencies. Incomplete (IN) is given students who have not completed prescribed work; it may be converted by completion of requirements. CO or IN not converted within the given time period will be changed automatically to an F. Absent (AB) is given students absent from final examinations. An excused AB may be converted to H, P, or F; an unexcused absence may not be removed and converts to an F.

Exceptions to the conditions stated above can be made only at the discretion of the Dean upon advice of the Promotions Committee.

*Promotions.* The Student Promotions Committee acting for the faculty recommends to the Dean promotion, graduation, dismissal, or any variation therefrom that, in the opinion of the Committee, is appropriate.

In view of its responsibility to the public, the medical faculty will exercise its obligation to dismiss any student from the Medical School if the student does not in the judgement of the faculty show sufficient promise, fitness, or appropriate moral character to justify his or her continuing in the study of Medicine regardless of academic performance.

If, in evaluating a student's performance for the year, the Promotions Committee finds that specific areas of weakness are revealed by the year-end examinations, the Committee may assign remedial work or require reexamination in such areas of weakness in spite of a total year-end examination score above the fixed passing level and may defer awarding the overall year-end grade until the Committee has evaluated the results of such remedial work or reexamination.

If the student's overall performance (including academic performance, promise, fitness, and appropriate moral character) for the year is considered unsatisfactory, the Promotions Committee makes what it considers appropriate recommendations and counsels with the student about his or her difficulties. He or she may be required to perform specific remedial work and pass reexaminations in a manner satisfactory to the Promotions Committee; may be required to repeat the year in a manner satisfactory to the Promo-

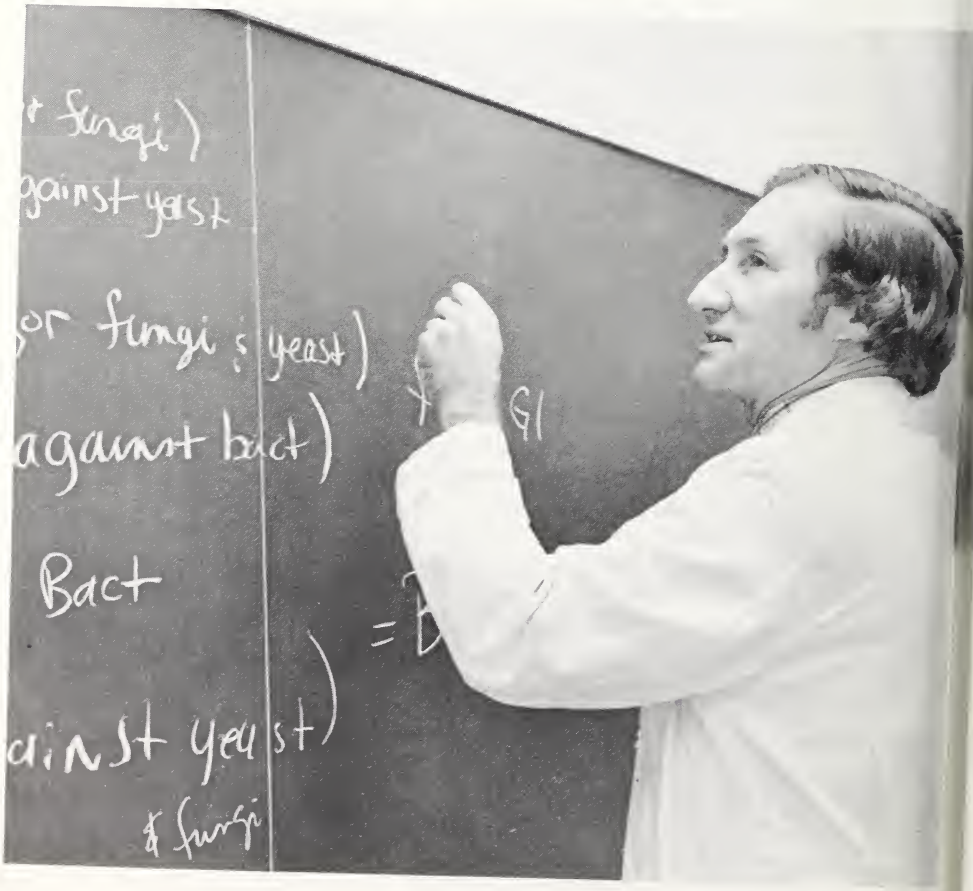
tions Committee; or may be dismissed if, in the judgement of the Promotions Committee, he or she does not show sufficient promise to continue in Medical School.

*Appeals*

Any medical student whose promotion is acted upon by the Student Promotions Committee may appeal an unfavorable decision in writing within five working days of the Committee's decision. The appeal may be made by a personal appearance before the Committee at a time set by the Committee and/or by writing a letter to the Committee. In the event the Student Promotions Committee denies the student's appeal, the student may appeal within five working days of the Student Promotions Committee's decision to the Appeals Subcommittee of the Advisory Committee of the Faculty of the School of Medicine, which shall hear student appeals from actions of the Student Promotions Committee. A final decision of the Student Promotions Committee may be reversed only by a majority affirmative vote of the Student Appeals Subcommittee and by concurrence of the Dean. For information purposes, a written report of the decision of the Student Appeals Subcommittee will be given to the full Advisory Committee of the Medical Faculty at its next meeting after the Student Appeals Subcommittee has reached its decision. Subsequent appeal following an unfavorable decision of the Student Appeals Subcommittee in which the Dean concurs, or following a favorable decision of the Subcommittee in which the Dean does not concur, is governed by the regulations of the University.

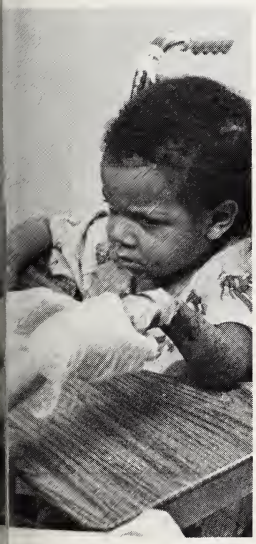
Absent compelling circumstances, a student seeking in his or her appeal to participate in a remedial program or to repeat a year may start in the appropriate program pending a decision by the Promotions Committee on his or her appeal, if the appeal to that Committee will not be heard and/or decided prior to the beginning of the program in which the student wishes to participate. If the Student Promotions Committee decides favorably on the appeal, the student may proceed in said program. If the Committee's decision is unfavorable, the student may no longer participate in the program unless a further timely appeal is made to the Appeals Subcommittee of the Advisory Committee. If that appeal is unsuccessful, the student may not participate further in the program even though a further timely appeal to the Chancellor is initiated by the student according to University regulations.

In view of the Student Promotions Committees' responsibility to the public, progress to the next level of promotion following a decision by the Student Promotions Committee denying such promotion will not be permitted pending an appeal. If the student's appeal to progress to the next level of promotion is ultimately successful, the faculty will take all appropriate measures to assist the student in making up the work that was missed.


fungi)
against yeast
or fungi ; yeast)
against bact)
Bact
ainst yeast)
& fungi

## *First-Year Curriculum, 1984–1985*

The first two years of medical school are the only time in the life of a physician devoted primarily to studying the scientific basis of clinical practice, and it is crucial to provide a firm biological framework for the inevitable technological changes in the future. Within this context, the majority of time in the first two years should be spent learning the science of medicine. Emphasis is given to demonstrating clinical implications and correlations. Medicine is also essentially a humanistic and caring profession, and these attitudes and skills are taught and modeled by faculty throughout, beginning in the first year. Medicine is influenced by a variety of social, cultural, ethical and economic issues, and the humanities and social and behavioral sciences are valued elements in the preclinical education of students at this medical school. The teaching of essential clinical skills begins early in the first year.



Classes in the first year will usually meet from 8:30–12:30 daily. At least two afternoons a week remain free of assigned responsibilities. The number of lecture hours/day will be limited to 3-3½/ hours/day, and small group problem-solving sessions, laboratories, and clinical case conferences will provide ample opportunities for active learning and stimulating exchange with faculty members.

The second year in the new curriculum (to be introduced in the fall of 1985) will consist of several major courses: Mechanisms of Disease, Pathology, Pharmacology, Epidemiology, Psychiatry, Physical Diagnosis, and Selective Seminars in social and cultural issues. Mechanisms of Disease will include 11 organ systems courses. Teaching will be integrated and multidisciplinary within and among courses. The emphasis on small group teaching and use of clinical examples in the first year curriculum will continue in the second year. Formal teaching will occur primarily between 8:00 and 12:30, and students should have two afternoons unassigned in most weeks.

### BIOCHEMISTRY

An introduction to general principles of biochemistry and metabolic regulation in man and other living organisms. The topics covered include protein structure, enzyme catalysis, acid-base regulation, central pathways of intermediary metabolism, hormonal and neural control systems, expression of genetic information, molecular mechanisms of disease, and nutrition. Lectures and case conferences to be solved by student groups.

*Dr. Stephen G. Chaney* — *140 Clock hours*

## CELL BIOLOGY

A course designed to provide entering students with an integrated view of the organization, structure and behavior of cells. The course will cover the structure and function of cell membranes, membranous organelles, the nucleus and the filamentous components of the cytoplasm. How cells interact with each other and with the environment will be discussed. Laboratory exercises will be used to illustrate and elaborate lecture material.

*Dr. Keith Burridge* — *22½ Clock hours*

## GROSS ANATOMY

Dissection of the human body, supplemented by lectures, demonstrations and conferences. The fall semester covers all regions except the head and neck. The head and neck are covered in eight weeks of the Spring Semester.

*Dr. O. W. Henson, Jr.* — *155 Clock hours*

## HISTOLOGY: STRUCTURE AND FUNCTION OF CELLS AND TISSUES

The course of Histology consists of 2 hours of lecture and 3 hours of laboratory per week for the first semester. The course is an introduction to the study of the structure of cells, tissues, and organs at the level of the light and electron microscopes. Emphasis is on structure-function interrelationships. Lectures are devoted to the functional morphology of cells and their organelles, chemical composition of cellular components and products, origin of specific cell types, and a histological and ultrastructural survey of the tissues and organ systems which characterize the human body. The laboratories provide the student with an opportunity to study the structural characteristics and interrelationships of normal cells, tissues and organs with the light microscope and electron micrographs. Self-instructional exercises and review sessions are also available to the students.

*Dr. M. G. O'Rand* — *70 Clock hours*

## IMMUNOLOGY

Principles of immunobiology, including molecular and cellular basis of the immune response, ontogeny, regulation, genetic control and immunoglobulin structure and function. Basic concepts are related to resistence to infection, allergy, tumor immunity, transplantation, autoimmunity and other diseases associated with abnormal immune function.

*Dr. David Klapper* — *51½ Clock hours*

## INTRODUCTION TO MEDICINE

This one and one-half hour course explores the concept of physician and patient, and some of the dynamics of their interactions.

Time is spent in two ways: case presentations which are complementary to the basic medical curriculum topics emphasize the varying medical and paramedical disciplines needed to help patients. The class is also divided into groups of eight students precepted by clinical faculty from all departments to work at the task of learning patient interviewing skills by direct patient contact, video-taping and review.

*Dr. James A. Bryan II* — *43½ Clock hours*

## MEDICAL EMBRYOLOGY

The aim of this course is to provide a concise presentation of the essential facts of human embryology, clarifying the gross anatomical features without omitting recent advances or changing concepts in the basic sciences. In addition to normal developmental processes, a description of congenital malformations and their etiology will also be presented.

*Dr. Thomas W. Sadler* — *20 Clock hours*

## MEDICAL PHYSIOLOGY

A general consideration of cell function and of systemic physiology is provided in four lectures a week during the spring semester of the first year. In addition, students will meet in small groups for two hours of problem-oriented analyses and laboratory exercises each week. The purpose of the course is to provide a mechanistic description of cell and bodily function to complement morphology and biochemistry, and to serve as a background for later courses and clinical work. Required of first year medical students; not open to others.

*Dr. Edward Perl* — *102 Clock hours*

## MICROBIOLOGY-VIROLOGY

This course is scheduled for four mornings per week during the spring semester. Lectures, group and individual discussions and laboratory exercises are used to introduce students to the study of infections caused by bacteria, viruses, fungi and parasites. Students are exposed to the basic concepts of structure, metabolism, growth and reproduction, genetics and control and regulation of procaryotes and single cell eucaryote systems. Emphasis is placed on the structural, chemical and biological nature of infectious agents, host-parasite interactions and the nature of resistance to infection, especially as these relate to prevention, diagnosis and treatment of infectious diseases.

*Dr. Philip F. Sparling and Dr. Sue Cancelosi* — *120 Clock hours*

## NEUROBIOLOGY

Prerequisites: physiology, anatomy, histology, cell biology. Required of first-year medical students.

The course is a multidisciplinary approach to the nervous system in health and disease. Structural and functional organization is analyzed at the level of the cell membrane, the neuron and integrated neuronal systems. Emphasis is also placed upon common pathological disturbances. Clinical cases are presented to illustrate anatomical, physiological and pathological points.

Eighty-seven hours, including lectures, demonstrations, discussion groups and laboratory exercises. The Departments of Anatomy, Neurology, Pathology, Physiology. Spring Semester.

*Drs. P. Farel and G. S. Oxford* — *87 Clock hours*

## SOCIAL AND CULTURAL ISSUES IN MEDICAL PRACTICE

Illness and healing take place in a cultural context that embraces the complexity of the human world, including historical legacy, ethical values, and changing social, economic and political forces. Through reading and seminar discussions, lectures, the writing of essays, group exercises, and the taking of a social-family history, students explore those social and cultural factors that influence how illness is perceived, diagnosed and treated. The role and responsibility of both patients and physicians in the organization and economics of health care are also emphasized.

The readings represent diverse approaches, including essays, short stories, social and economic analysis and ethical argument, among others. Students are encouraged to develop critical abilities to approach the readings and to assess the assumptions that shape current medical practices and medical education.

Most classes are conducted as seminars in which approximately eighteen students are led by a clinician and a faculty member from the social sciences or humanities. Lectures are given when appropriate.

*Dr. Larry R. Churchill* — *43½ Clock hours*

## THE SELECTIVE SEMINARS PROGRAM

A series of seminars will be offered in the new curriculum. The purposes of this program are to allow students to select topics to study indepth, to be engaged in stimulating discussions with a small group of students and one faculty member, and in this process, to gain a better understanding of how science is made. Students are required to select two seminars before the end of the second year, one in the biomedical sciences and one in the social sciences, behavioral sciences or the humanities. This description covers the biomedical science seminars. A description of the program for the seminars in the social sciences, behavioral sciences and the humanities will be developed in 1984. These seminars will be selected in the second year.

It is intended that the average number of students in a seminar will be eight. Seminars will meet for a minimum of six two-hour sessions. The students will be expected to spend considerable time outside of class reading primary sources and preparing to lead the discussion in one of the sessions.

Students should complete the basic science courses (or have considerable prior experience) before taking a seminar in that discipline; for example, in the second semester of the first year students may select seminars in biochemistry, immunology, histology and cell biology but not in microbiology, and other second semester or full year courses. A list of the biomedical sciences seminars to be offered in the spring of 1985 will be given to first year students by the middle of the first semester.

Students who wish to substitute laboratory research or a literature review project for the selective in the biomedical sciences should contact the faculty member they wish tc work with and then submit a proposal to Dr. Harry Gooder, Director of the Biomedical Selective Program.

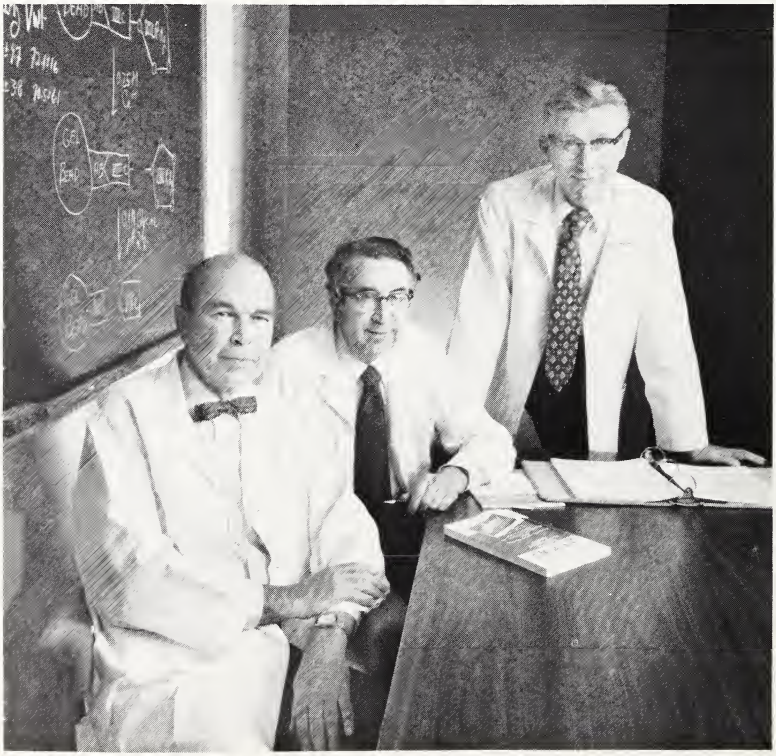


*Photo by Yousef Karsh, Ottawa*

# Second-Year Curriculum, 1984–1985

The courses are generally organized around organ systems and involve coordinated teaching among faculty from the basic and clinical sciences. Pathophysiology is emphasized throughout. Classes meet from 8:00–1:00 daily with afternoons reserved for free time and study, a few classes, and work related to patients assigned to students in the Physical Diagnosis course.

## CARDIOVASCULAR—RESPIRATORY SYSTEMS

This is a systematic study of the cardiovascular-respiratory systems with stress on the functional mechanisms which are especially relevant to the practice of medicine. Emphasis is placed on physiology, pathology and clinical correlations.

*Dr. Lloyd Yonce* — *130 Clock hours*

## ENDOCRINE SYSTEM

The objectives of the course will be to learn about the physiology, biochemistry, anatomy, pathology and pharmacology of the major endocrine glands in humans. Emphasis will be placed on those areas of basic endocrinology which are most essential in the practice of medicine. Selected endocrine diseases will be considered as examples of endocrine pathophysiology.

*Dr. H. Shelton Earp* — *65 Clock hours*

## GASTROINTESTINAL SYSTEM

Gastroenterology. Disorders of the digestive system, including the hepatobiliary tract and pancreas, are presented by correlative approach. The Departments of Physiology, Pathology, Medicine, Surgery, and Radiology collaborate in presenting basic science aspects of digestive diseases using illustrative clinical materials where appropriate.

*Dr. Roy C. Orlando* — *50 Clock hours*

## GENETICS

The principles of human genetics as applied in medicine are taught with emphasis on practical examples which illustrate these principles.

*Dr. Michael Swift* — *25 Clock hours*

## HEMATOLOGY

This course is designed to give the student an overview of the broad field of Clinical Hematology. It includes both lecture and laboratory periods. An important aspect of the course is to permit sophomore medical students to learn peripheral blood and bone marrow morphology. The ability to interpret peripheral blood smears is essential for any physician and is one of the most important simple laboratory tests. A laboratory booklet is provided.

*Dr. Steve Bernard and Dr. Eugene P. Orringer* — *30 Clock hours*

## INTRODUCTION TO PSYCHIATRY

Introduction to Psychiatry meets two hours per week throughout the second year. Lectures, video-taped interviews and patient demonstrations are used to present the essentials of medical psychiatry. Current concepts of etiology and treatment of the major psychopathologic entities are considered. Sessions devoted to problems of substance abuse, psychosomatic medicine, human sexual behavior, forensic psychiatry and problems arising in childhood and adolescence are included.

*Drs. Bakewell, Ewing, Andresen, Fidler and Gualtieri* *52 Clock hours*

## MEDICINE AND SOCIETY

The course is in two parts, each covering approximately one-half of the academic year. **Part One** consists of small seminars; students select their seminar from among the several offered. Each seminar explores in depth a specific topic in social medicine and examines qualitative data from one or more of the disciplines of ethics, history, literature, economics, and the social and policy sciences. The seminars are taught by a variety of faculty from the School of Medicine and the College of Arts and Sciences. In **Part Two** students are instructed in the quantitative analysis and interpretation of clinical literature using the tools of biostatistics and epidemiology. Faculty for this sequence of lectures and seminars are generally clinicans trained in these disciplines. Students are required to take both parts.

*Dr. Donald L. Madison* *50 Clock hours*

## MUSCULOSKELETAL SYSTEM

The goals of the Musculoskeletal System course are to acquaint the student with the normal development, structure and function of the musculoskeletal system and to introduce him to the normal physiology and biochemistry of bone cartilage, synovium, and muscle. The pathological conditions altering normal structure, function, and biophysiology of the musculoskeletal system will be introduced and applied to the diagnosis and treatment of patients with musculoskeletal pathology.

*Dr. Frank Wilson* *50 Clock hours*

## NUTRITION

During the academic year 1984–1985 the emphasis of this course is upon basic and clinical nutrition. Following a discussion of the basic biochemical aspects of nutrition there will be an introduction to the application of such knowledge to the following clinical areas or problems: obstetrics, pediatrics geriatrics, gastroenterology, diabetes, obesity, cardiovascular disease, renal disease, elemental and parenteral nutrition and toxicity of food additives and contaminants. The course is presented by means of lectures, case conferences, dietary workshops, and discussion sessions.

*Dr. Stephen Chaney* *25 Clock hours*

## PHARMACOLOGY

This course is designed to present the principles for the scientific use of drugs in modern therapeutics. A basic background in biochemistry and physiology is assumed. The major objective of the course is to enable the student to understand the concepts and facts about drugs so as to apply these ideas now, and in the future to rational therapeutics. Facts and concepts are presented in lecture and self-instructional formats. Clinical applications are presented as in problem-solving sessions.

*Drs. Cubeddu, Goz; associates.* *90 Clock hours*

## PHYSICAL DIAGNOSIS

This course builds on the understanding of the doctor-patient relationship and the interviewing skills developed during first year in Introduction to Medicine. Large group meetings are held weekly to discuss common clinical topics and to demonstrate the physical examination. The students are also divided into small groups under the direction of clinical faculty for the study of medical history-taking, physical examination, and the oral and written patient presentation. Individual patient assignments on the medical wards are supplemented by small group sessions in the surgical subspecialties. The examination of patients during small group preceptorships may be done at AHEC locations.

*Dr. Axalla J. Hoole* — *84 Clock hours*

## RADIOBIOLOGY

This course is designed to introduce the students to various modalities in the management of patients with cancer. The principles of diagnosis, treatment, and prognosis of certain malignant diseases are presented. The importance of an interdisciplinary approach (surgery, chemotherapy, radiotherapy) is stressed. Basic concepts regarding the effects of irradiation upon living tissues are presented. The course is given in the form of classroom lectures and the presentation of patients who have received or are undergoing treatment for malignant diseases.

*Dr. Jan Halle* — *20 Clock hours*

## REPRODUCTIVE BIOLOGY

75 hours of instruction are given to provide the student with pertinent information regarding the major contemporary anatomic, developmental, physiologic and behavioral aspects of human reproduction. The student will become familiar with the basic reproductive anatomy of males and females, reproductive endocrinology, biology of germ cells, physiology of pregnancy, and labor, population dynamics and human sexuality. This basic knowledge will be related to normal and pathological changes to be encountered in clinical medicine.

*Dr. Mary G. Hammond* — *75 Clock hours*

## SKIN AND CONNECTIVE TISSUE

The purpose of this course is to introduce the student to the structure, function and pathology of skin and connective tissue. The following topics are dealt with specifically: biology of the epidermis, hair and nails; melanocytes and melanin pigmentation; eccrine gland function and disorders of sweating; photobiology and function and abnormalities of the major fibrous and nonfibrous components of connective tissue. Stress is placed on the integration of clinical and microscopic pathology of specific disease states and reaction patterns involving skin and connective tissue.

*Dr. Robert Briggaman* — *20 Clock hours*

## URINARY SYSTEM

This is a multidisciplinary course that stresses general principles. The objectives of the course are to review the principles of kidney function, to provide an understanding of the factors that determine and control the volume and composition of the body fluids and to discuss the morphological alterations in the diseased kidney and their functional implications. Clinical examples are extensively utilized to illustrate physiological principles. Various teaching methods are utilized, including lectures, small group discussions and laboratory exercises.

*Dr. Hillel J. Gitelman* — *55 Clock hours*

## THE TRANSITION COURSE

This is a required two-week course for medical students offered for the first time between the second and third year in the Spring of 1984. The course is designed as a bridge between the basic medical sciences and the applied clinical sciences and will provide an introduction to the environment, the people and the skills of the hospital. The course will consist of a series of activities and formal sessions, including an introduction to the interpretation of laboratory tests, X-rays and the EKG. Students will use and apply to case problems the various sources of clinical information: the patient, the expert consultant, on-line citation data bases, the medical record, colleagues and the current literature. They will interview a patient, gather clinical data, make a differential diagnosis and plan the management of patients through a series of case presentations completed individually and in small groups with faculty and student preceptors providing guidance and consultation. Many members of the extended health care team will be involved to demonstrate the role of team care in the current practice of clinical medicine.

## *Third Year Curriculum*

In the third year the student rotates through the clinical services of five major disciplines: Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry, and Surgery. The student is exposed to the principles of Family Medicine during a required four-week preceptorship, which is usually taken in the fourth year. In addition to learning the content, skills and attitudes specific to each clinical specialty, students receive ongoing instruction in the many areas of clinical medicine that cut across disciplines: the social, ethical, legal, and psychological aspects of medical practice; the health delivery system; and the practice of cost-effective medicine. Basic clinical skills such as history-taking and physical examinations are emphasized, as appropriate, in each clerkship. The AHEC centers play a major role in the third and fourth years and offer experiences in community hospitals and with private practitioners.

### SURGERY (12 weeks)

Students study assigned clinical cases under the direct supervision of instructors. General surgery and all of the surgical specialties are covered in the 12-week period. The Life Support Skills course is included in this clerkship. Both inpatient and outpatient facilities at the North Carolina Memorial Hospital are used. The students serve as clerks on the various surgical services with their work being carefully supervised and evaluated by members of the resident and attending staff. This experience is complemented by lectures, seminars, conferences, small group discussions, and rounds.

### MEDICINE (12 weeks)

Students spend time on the wards of medical services (2 months at North Carolina Memorial Hospital and one month at an affiliated hospital). Emphasis is on the acquisition of knowledge of medicine through study of patients assigned to the students. Students participate actively in daily work rounds and attending rounds and in the management of patients on the service. A variety of conferences and lectures are offered, highlighted by the Tuesday Medicine-Pathology Conference and Thursday Grand Rounds.

### PEDIATRICS (6 weeks)

Students work in small groups on the pediatric inpatient, nursery, and outpatient units. They participate in the study and care of individual patients. Emphasis is placed on the growth and development of the normal child and on the changes in emotional, physical and laboratory parameters. Through guided reading and frequent conferences with members of the staff, the student is encouraged to develop an understanding of the pathophysiology of the diseases which affect infants and children and the extent to which physical, emotional, genetic and environmental factors are important. The student is encouraged to cultivate proficiency in interviewing, in the examination of infants and children, and in the establishment of rapport with children and their families. Through actual experience with patients and daily attendance at rounds the student develops competence in the diagnosis of illness and participates in the care of children

who are not well. The importance of patient and parent education and of health preservation is stressed.

## OBSTETRICS AND GYNECOLOGY (6 weeks)

Students participate actively in the prenatal, intrapartum, and postpartum care of normal and abnormal obstetrical patients. They are actively concerned with the diagnosis and treatment of minor and major gynecological problems in the Outpatient Department and on the hospital wards. The clerkship may be spent in an affiliated community hospital.

## PSYCHIATRY (6 weeks)

Students receive clerkship training in the three teaching hospitals of the Department of Psychiatry: Dorothea Dix Hospital, The Fayetteville Veterans Administration Hospital (optional), John Umstead Hospital and the North Carolina Memorial Hospital.

Student instruction includes extensive, closely supervised work with patients. All sites also offer seminars, case conferences, supervised reading and clinical problem-solving tutorials. Each site maintains a student learning and study center with reference materials, videotaping and playback facilities, and instructional materials such as self-instructional packets and videotape programs.

The curriculum is integrated with the content of the second year course in Psychiatry, and the curriculum objectives are given to all students for use in planning, organizing and guiding their study of psychological medicine. The curriculum is organized to equip the student with knowledge, skills and attitudes from this specialized area of medicine which will be useful in all medical work. Such content includes understanding of matters such as the nature of stresses, methods of adaptation, constructive use of the doctor-patient relationship, and the utility of the biopsychosocial perspective in patient evaluation and medical care.

# Fourth Year Curriculum

The purposes of the fourth year of medical school are to allow students to develop and apply problem-solving skills to clinical situations, to have varied clinical experiences and to enrich their scientific and clinical education. Students are required to take seven electives, two of which must be an acting internship at an AHEC hospital and a preceptorship in Family Medicine. Most students take more than seven electives, and many students take one or more research or nonclinical elective before the fourth year. The student selects an elective program in consultation with his or her electives advisor. Electives advisors offer guidance in the student's chosen specialty, and in the case of an undecided student, counsels the student in an appropriate general course of instruction. Elective selection is coordinated through the Student Records Office of the School of Medicine under the supervision of the Committee for Elective Programs. Scheduling is done through that office; students must comply with the regulations published by the Committee for Elective Programs.

As indicated by the list of over 200 electives given below, the School offers a flexible program so that students can pursue areas of special interest and create a balanced program that best suits an individual student's needs and career goals.

## THE DEPARTMENT OF ANATOMY

108. MOLECULAR BASIS FOR BIOLOGICAL FUNCTION (4). Molecular behavior as the basis for biological function. Key concepts of molecular structure, interactions, and dynamics applied to biological systems with emphasis on membrane structure and function and major cytoskeletal structural elements. Demonstrations of techniques of current interest. Syllabus available on request. Blaurock.

200 a.b. ADVANCED GROSS ANATOMY (3 hours Fall; 2 hours Spring). See page *119* for complete description.

401. CLINICAL ANATOMY (6). Prerequisite: Anatomy 107 and permission of instructor. For fourth year students interested in applied gross anatomy. Emphasis on anatomical details and their clinical significance and on radiographic anatomy. Specific regions may be selected. *15 library hours, 15 laboratory hours, and 5 lecture hours a week for one elective period (11).* Henson.

## THE DEPARTMENT OF ANESTHESIOLOGY

401. ACTING INTERNSHIP IN ANESTHESIOLOGY (6). The primary objectives of the acting internship are to provide a knowledge of and training in the principles of anesthesia and intraoperative care. This acting internship is designed for both those

considering anesthesiology as a primary career choice and for those for whom a knowledge of anesthesiology might be thought beneficial.

Experience will include: pre- and postoperative evaluation of patients; care of the unconscious patient; application of clinical pharmacology and physiology to the perioperative period; the review and practice of regional, inhalational and intravenous techniques; exposure to intravenous administration of drugs, airway management, endotracheal intubation, cardiovascular monitoring, and the care of critically ill patients during the operative period; further training in the principles of cardiopulmonary support and resuscitation; and the option to study diagnosis and treatment of chronic pain problems.

402. ANESTHESIA INTENSIVE CARE (6). The student will make rounds daily with both residents and critical care medicine faculty. Critically ill patients throughout the hospital will be seen. Emphasis will be placed on the diagnosis and treatment of cardiovascular, respiratory, renal, neurological and metabolic failure. Correlations between physiology, pharmacology, and current invasive monitoring devices and systems will be stressed. Technical aspects regarding respiratory therapy equipment will also be discussed during both ICU rounds as well as during didactic sessions. This elective would be relevant for individuals contemplating future training in all medical specialties who will occasionally be called upon to treat the critically ill.

## THE DEPARTMENT OF BIOCHEMISTRY

134. CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3). See page 127 for complete description.

140. INTRODUCTION TO CHEMICAL PATHOLOGY (3). See page 127 for complete description.

143. PHYSICAL BIOCHEMISTRY (2). See page 128 for complete description.

144. PHYSICAL BIOCHEMISTRY (2). See page 128 for complete description.

227. NEUROCHEMISTRY (3). See page 128 for complete description.

301. RESEARCH IN BIOCHEMISTRY (var.). See page 131 for complete description.

302. RESEARCH IN BIOCHEMISTRY (var.). See page 131 for complete description.

401. APPLICATIONS OF AUTOMATED BIOCHEMICAL METHODOLOGY TO METABOLIC DISORDERS (6). This course is designed for the fourth year medical student who desires more detailed exposure to biomedical technology which can be applied to diagnosis and treatment of metabolic and nutritional disorders, particularly inborn errors of metabolism associated with mental subnormality. The course is conducted on a tutorial basis with the student initiating with the instructors a series of discussions on varied topics. These discussions are supplemented with rather extensive readings and laboratory exercises. It is likely that a selected research project could be carried out in collaboration with the staff. The exact nature of the course work will be set up after preliminary discussions with the student. G. K. Summer.

402. INTRODUCTION TO BIOCHEMICAL TECHNIQUES FOR MAMMALIAN TISSUE CULTURE SYSTEMS, Bioc. 22 (6). This course is an introduction to tissue culture techniques which can be used for biochemical studies on mammalian cells. The student will be instructed in the proper handling of cells, sterilization techniques, harvesting, separation, and assay procedures for isotopic and enzyme studies. Recent advances in the field of somatic cell genetics have brought a number of applications of tissue culture methods to clinical problems. In particular it has been possible to diagnose many in-

herited metabolic disorders by culture of amniotic fluid cells and skin fibroblasts from suspected cases. These developments have enabled clinicians and geneticists to advise parents on the advisability of continuing or terminating pregnancies if a particular enzyme deficiency can be identified in culture cells. Genetic counselling can then be provided for the parents of affected children and other members of the family. This introduction should provide the student with sufficient background to proceed to more advanced applications of biochemical studies in mammalian cells in tissue culture. G. K. Summer.

## THE DEPARTMENT OF DERMATOLOGY

401. DERMATOLOGY (6). Activities will include outpatient clinics 5 days a week, ward rounds once or twice a week, 5 conferences or seminars per week, and time for reading. The student should become proficient in diagnosis and management of most of the common diseases of the skin, and he or she should acquire considerable knowledge of the pathology and physiology of skin. A portion of the time may be spent in the private office of a practicing dermatologist and in outlying AHEC clinics. One to four students may be accommodated for four weeks at a time (one elective period). Students must be willing to fly to clinics for the day. Briggaman, Gammon, O'Keefe, Tomsick, Wheeler, Woodley.

402. RESEARCH IN DERMATOLOGY (12). This elective is designed for the student at any level who desires to spend a minimum of two months full-time in one of the dermatology research laboratories. Depending upon the desires of the student and the preceptor, problems using the basic methods in immunology, tissue culture, immunofluorescence, electrophoresis, or electronmicroscopy may be covered. Interested students should contact one of the faculty at least two months prior to the anticipated starting date. *Two elective periods required.* Briggaman, Gammon, O'Keefe, Woodley.

404. DERMATOLOGY OVERVIEW (0). This is a part-time elective consisting of a series of 45 minute slide/talk sessions covering clinical, diagnostic, pathophysiologic, and therapeutic aspects of common dermatologic diseases. It is conducted in the Dermatology Library Conference Room on certain Thursdays at 1 p.m., depending upon the scheduling by the resident staff.

405. DERMATOLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). This rotation is a preceptorship with a group of dermatologists having a large office practice. Most of the student's time is spent examining and assessing patients with a wide variety of skin problems under the direct supervision of practicing dermatologists. Regular review of dermatopathology specimens with the dermatopathology resident and senior pathologists and attendance at dermal consultations and medical conferences in the hospital are available to the student. Clinical faculty in Dermatology.

## THE DEPARTMENT OF FAMILY MEDICINE

FMME 401. FAMILY MEDICINE AND COMMUNITY FIELDWORK (6). The purpose of this elective is to provide students with an opportunity to precept with a family physician practicing in an ambulatory setting and observe the delivery of health care in that community. For preclinical students, credit for this course will be based solely upon the completion of a community questionnaire which must be turned in one week after completion of the elective. The questionnaire looks at factors in the community such as industry, health resources, and demographic data and is designed to be completed in increments throughout the elective. For clinical students, credit will be based on the preceptor's assessment of his/her performance. All students are responsible for selecting a preceptor initially, and formal approval will be made by the course director. Interested students should contact the Student Office of the Department of Family Medicine (966-3385) to arrange for interviews and credit. This elective may not be substituted for FMME 410, the required Family Medicine Preceptorship.

FMME 405. BALINT GROUP (1). Prerequisite: completion of the first year of medical school. The aim of this elective is a free give-and-take atmosphere in which everyone can bring his/her problems in the hope of getting some light on them from the experience of others. The material for discussion will be provided by recent experiences with patients reported by participants which will be followed throughout the course. The chief aim, therefore, is to examine the ever changing doctor-patient relationship, i.e., the study of the pharmacology of the drug, "Doctor." Interested students should contact the Student Office of the Department of Family Medicine (966-3385) to arrange interviews.

FMME 406. DIRECTED STUDIES IN FAMILY MEDICINE I (3). Prerequisite: admission to medical school. This course is designed to familiarize preclinical students with issues and perspectives in family medicine. Students will observe and participate in investigative studies in family medicine and primary care. Exposure to research methodology and research projects in process is an integral facet of the course. Topics range from medical systems and continuity of care to family health behavior and doctor-patient interaction. Interested students should contact the office of Dr. Peter Curtis in the Department of Family Medicine (966-2091) to arrange an appointment.

FMME 407. DIRECTED STUDIES IN FAMILY MEDICINE II (6). Prerequisite: completion of second year of medical school. This course is designed to allow a student in the clinical years to carry out a project in family medicine. Students will design and conduct a research project under the direction of a practicing physician. The course will emphasize the clinical relevance of social and epidemiological research methods. Resources for this experience include the Family Practice Data Bank, which contains information from 24,000 daytime patient visits and 4,000 after-hours calls. Alternatively, students may concentrate upon refining clinical diagnosis and management. Both hospitalized and ambulatory patient care would be included. Interested students should contact the office of Dr. Peter Curtis in the Department of Family Medicine (966-2091) to arrange an appointment.

FMME 408. HEALTH CARE FOR FEMALE PATIENTS (1). Prerequisite: admission to medical school. This elective will focus on issues relevant to primary medical care of female patients. Topics for seminar discussion include: women's perspectives on health care; implications of the women's health movement for primary medical care; woman's traditional role as caretaker of family health and the influence of changing roles of women on family health; comparison of utilization of primary medical services by women and men; social issues in the clinical management of prevalent non-life-threatening health problems for women. This elective will be taken either as a tutorial or as a seminar. By prior arrangement with the instructor, the tutorial may be taken anytime during the year. Students will have approximately 5 meetings with the instructor and will be required to prepare either a paper or a research proposal on a topic selected in consultation with the instructor. The seminar will be limited to a manageable group and will be geared to the individual interests of the enrolled students. The seminar will meet once a week during the spring semester for two hours per week. Each student will be expected to make one class presentation on a selected topic about primary care for women. Presentations may be either individual or group projects. Interested students should contact Dr. Betty Cogswell at 966-5742 to arrange appointments.

FMME 409. CLERKSHIP IN FAMILY MEDICINE (6). This four-week elective course in family medicine focuses on the following areas: the family, the community, occupational and environmental health, common ambulatory problems, health maintenance, and office laboratory procedures. The first three days of the clerkship are spent in Chapel Hill where students cover these topics in seminars that are presented by family medicine faculty and through selected readings. Students spend the remaining three-and-a-half weeks in the private practice of a family practitioner preceptor. Students are required to complete the following projects during the clerkship: 1) conduct and write up a family interview in a patient's home; 2) visit and report on a community health agency; and 3) visit and report on a work place and do an occupational health history on a patient in the preceptor's practice. The last day of the rotation is

spent in Chapel Hill where the students present their projects to the family medicine faculty in a seminar format. Students' evaluations are determined from three performance areas; 1) their preceptor's assessment of their performance in his/her practice; 2) their performance on the three required projects; and 3) a final exam that assesses their knowledge of selected ambulatory medical problems. This course will satisfy the requirements for the required fourth-year Family Medicine Preceptorship, FMME 410. For information, contact the Student Office of the Department of Family Medicine at 966-3385.

FMME 410. FAMILY MEDICINE PRECEPTORSHIP (SELECTIVE) (6). Required of all fourth-year students; FMME 409 in the third year can fulfill the requirement. Students will observe and participate in the patient care activities of selected physician preceptors in North Carolina communities. Student placement will be in practice sites associated with AHEC programs. The Family Medicine Preceptorship for senior students includes the following goals: 1) to participate in family practice, emphasizing the acquisition of knowledge and skills in the identification and primary management of common problems and ambulatory patients; 2) to participate in evaluation, education and treatment of patients and their families, utilizing knowledge of their socioeconomic and psychological settings; 3) to appreciate the value of continuity of care for the doctor-patient relationship; 4) to function within the health care team in the family physician's office; 5) to participate in patient care involving medical resources within the area, including available consultants, hospitals, social agencies, public health agencies, ministers, and mental health facilities.; 6) to observe basic aspects of practice management, including the medical record system, patient flow, billing and collection procedures; 7) to observe the family physician's lifestyle and the community setting of his/her practice. Family Medicine faculty and selected physician preceptors.

FMME 411. OCCUPATIONAL MEDICINE PRECEPTORSHIP (6). Prerequisites: completion of second year of medical school and permission of course instructor. Students will work on an occupational health project with selected preceptors, unions, and worker groups in North Carolina. The projects will be negotiated between the student and the preceptor before the preceptorship. A three-day orientation session will be held. Goals for the occupational medicine preceptorship are: (1) to increase basic clinical knowledge in environmental and occupational health; and (2) to increase skills in occupational/environmental history-taking; diagnosis, treatment, and prevention of occupationally induced disease; and assessing risks in the workplace. Students will develop management plans for problems. Housing and one round-trip mileage reimbursment will be provided, except for sites which are in the Chapel Hill area. All requests should be directed to the office of the curriculum coordinator, Ms. Kay Lovelace, at 966-3385.

FMME 413. INSTRUCTION AND EVALUATION IN MEDICAL EDUCATION (var.). (MEDI 419). Prerequisites: completion of first year and permission of instructor. This elective has been designed for the student who is considering a career in medicine that involves some teaching. The elective will be structured individually depending upon the student's specific interest, but it will center on participation in some type of instructional development, teaching, and/or evaluation project. Various aspects of the new curriculum, general educational research and development and/or educational uses of the computer are potential focii. It is likely that the student will want to conduct his/her own project in consultation with an adviser from a basic science or clinical department and a faculty member from the Office of Research and Development for Education in the Health Professions (ORDEHP). The project might focus on possibilities for particular courses and programs such as (1) assessing and determining instructional needs; (2) analysis of instructional resources for developing or improving a program; (3) determining and designing a program's instructional goals or objectives; (4) designing instructional media, (5) determining and developing an appropriate teaching strategy; (6) developing student self-assessment approaches; (7) developing computerized simulations for teaching and evaluating, or (8) designing and implementing evaluation

methods. For more information, contact Dr. Frank Stritter, Director, ORDEHP at 966-3641.

FMME 416. ASHEVILLE ADVENTURE IN FAMILY MEDICINE (6). Prerequisites: completion of second year and completion of two clinical clerkships. For students whose goal is to experience the practice of medicine realistically, this course promises to be a unique learning opportunity. The rotation takes place in the offices of young, enthusiastic family physicians. Weekly seminars and discussion sessions conducted by the Mountain AHEC Family Practice Residency Program faculty create the forum to explore the principles of family medicine. The strong family-oriented culture of the rural mountain communities provides an excellent opportunity to participate in the practical application of family medicine concepts. This course may be taken in the third or fourth year. For information, please contact Linda Houseman in the Student Office of the Department of Family Medicine at 966-3385.

FMME 420. ACTING INTERNSHIP, INPATIENT FAMILY MEDICINE—GREENSBORO, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisites: permission and completion of all clinical clerkships. The Family Medicine Inpatient Service will incorporate the acting intern as a member of the patient care team. Daily activities will include rounds, conferences, patient work-ups, supervised procedures, and other inpatient management. Students will have an opportunity for ambulatory follow-up, when possible, and other ambulatory care in the residency model unit. Students will be included in the night call schedule. For permission and further information, contact Linda Houseman in the Student Office of the Department of Family Medicine at 966-3385.

FMME 421. ACTING INTERNSHIP, INPATIENT FAMILY MEDICINE—ASHEVILLE, MEMORIAL MISSION HOSPITAL (6). Prerequisites: permission and completion of all clinical clerkships. The Family Medicine Inpatient Service will incorporate the acting intern as a member of the patient care team. Daily activities will include rounds, conferences, patient work-ups, supervised procedures and other inpatient management. Students will have an opportunity for ambulatory follow-up, when possible, and other ambulatory care in the residency model unit. Students will be included in the night call schedule. For permission and further information, please call Linda Houseman in the Student Office of the Department of Family Medicine at 966-3385.

FMME 422. ACTING INTERNSHIP, INPATIENT FAMILY MEDICINE—CHARLOTTE MEMORIAL HOSPITAL (6). Prerequisites: permission and completion of all clinical clerkships. The Family Practice Center and Family Practice Inpatient Service will incorporate the acting intern as a member of the patient care team. Daily activities will include rounds, conferences, patient work-ups, supervised procedures, and other inpatient management. Students will have an opportunity for ambulatory follow-up and other ambulatory care in the Family Practice Center. Students will be included in the night call schedule. For permission and further information, please contact Linda Houseman in the Student Office of the Department of Family Medicine at 966-3385.

FMME 442 (MEDI 442). CARE OF THE ELDERLY PATIENT (CLINICAL GERIATRICS) (6). Prerequisite: completion of third year Medicine clerkship. In this clerkship, the student will be expected to develop skills in: (a) communicating with elderly patients and their families; (b) evaluating their physical, emotional, social and economic abilities to cope with the normal activities and stresses of daily living; (c) assessing the causes of common problems among the elderly (including delirium, dementia, falls, depression, incontinences); and (d) working with patients, families, health professionals from many disciplines, and community agencies to develop rehabilitation goals and implement appropriate care plans. Selected geriatric patients will be evaluated and followed in the clinics and wards of NCMH and Wake County Medical Center, utilizing interdisciplinary team home visits, rounds in nursing homes, and conferences. For more information, contact Dr. Paul Beck at 966-4161.

## THE DEPARTMENT OF MEDICINE

AHEC 401. ACTING INTERNSHIP — MEDICINE — MOSES CONE MEMORIAL HOSPITAL (6). Students will serve as acting interns on the medical service at Moses H. Cone Memorial Hospital. They will serve as the primary physicians to patients with both acute and chronic medical problems. One student will be assigned to Team A which consists primarily of private patients who are admitted by private attendings. The other student will be assigned to Team B which consists primarily of unassigned patients admitted from the clinics and emergency room. An AI carries the patient load of an intern and is supervised by a junior or senior medical resident. All conferences, seminars, and rounds will be open to the students. McCue.

AHEC 402. ACTING INTERNSHIP — MEDICINE — CHARLOTTE MEMORIAL HOSPITAL (6). This rotation emphasized primary patient care involving a blend of inpatient and outpatient experiences. The medical student functions as an acting intern on one of three ward services. He will experience primary responsibility for the care of his assigned patients under the supervision of a junior resident and a full-time attending. Required conferences include daily subspecialty lectures, ECG conferences three times weekly, and weekly grand rounds. He or she will attend the general medicine outpatient clinic every third weekday. This provides a means of developing skills for the efficient management of acute and chronic illnesses as seen in the office of a general internist. Faculty: Dr. McCall and Dr. Shellhorse.

AHEC 403. ACTING INTERNSHIP — MEDICINE — WAKE COUNTY MEDICAL CENTER (6). Students will serve as acting interns on the medical service at Wake County Medical Center and function as primary physicians to patients with both acute and chronic medical problems. The course offers an opportunity for students to see how clinical medicine is practiced in a community hospital. The students will work closely with both practicing physicians and full-time faculty, as well as house-staff, in care of these patients. At the completion of this acting internship, each student will be expected to demonstrate competence in obtaining pertinent clinical data through the history and physical examination; in clinical reasoning and diagnostic acumen; in ability to formulate and implement cogent and practical diagnostic and therapeutic plans; in ability to establish effective productive relationships with patients, professional colleagues and other health team members; in assuming professional responsibilities, including self directed learning; and in understanding the physician's role in dealing with the biomedical and psychosocial problems of patients. Faculty at Wake and UNC.

403. MEDICAL ONCOLOGY (6). Prerequisite: completion of all clinical clerkships. The elective will consist of (1) didactic presentations and seminars on a variety of oncologic topics; (2) bone marrow, histopathology and x-ray review; (3) inpatient and outpatient consultations. The student will work closely with the oncology team which is composed of a house officer, fellow, physician's assistant, nurse oncologist and attending. Hematology/Oncology Staff.

AHEC 404. ACTING INTERNSHIP — MEDICINE — NEW HANOVER (STAFF SERVICE) (6). The student will serve as an acting intern on the medical service at New Hanover Memorial Hospital, serving as a physician to patients with both acute and chronic medical problems. The student will be assigned to team A which consists primarily of non-private patients admitted from the clinics and emergency room. Team A consists usually of a first and third year resident along with the AI and a third year medical student under the supervision of a full time faculty member.

The course offers an opportunity for students to learn and experience practical clinical medicine. Students work closely with housestaff and attending physicians in the care of these patients. All conferences, seminars, and rounds will be open to the students. Dr. Werk and clinical faculty at New Hanover and UNC.

404. GENERAL INTERNAL MEDICINE CONSULTANT (6). Prerequisite: completion of all clinical clerkships. This elective provides experience for the student in the consultative role of the general internist as it relates to general surgery, obstetrics, orthopedics, and other disciplines. An average of two inpatient consults are evaluated per day under the supervision of a senior medical resident. Daily attending rounds will focus on the efficient definition of the pertinent medical problems involved and the derivation of appropriate management recommendations. Drs. Greganti, Bryan, Davidson, R. Fletcher, Hoole, Kizer, Nuzum, Pickard, Putnam, Siscovick.

AHEC 405. ACTING INTERNSHIP — MEDICINE — EDGECOMBE GENERAL HOSPITAL. The Tarboro Clinic, P.A. is a 20 physician multi-specialty group practice located adjacent to the Edgecombe General Hospital, a 125-bed general hosptial. The acting internship is designed to acquaint the student with the scope of services for which a general internist is responsible. The student will work in the Tarboro Clinic, P.A. group practice facility during the day and will take night call in association with his attending physician. He will be responsible for the initial history and physical on those patients whom he encounters who require admission and will be responsible for their follow-up with the admitting physician during the hospitalization. Daily teaching rounds on the in-patient service will be conducted by members of the Tarboro Clinic, P.A. staff. Opportunities will also be made available to the student to spend brief periods of time on other health facilities in the community such as the health department, satellite clinics, social service office, solo practitioner's office, and local mental health facility. The student will also participate in weekly teaching conferences of the clinic and hospital. Whaley and Brooks.

405. CLINICAL CARDIOLOGY (6). Prerequisite: basic science and clinical ward experience. Emphasis is placed on (1) physical diagnosis of heart disease, (2) electrocardiography, (3) management of cardiac problems seen in consultation on inpatients. (4) hypertension problems in diagnosis and management, (5) diagnostic and management problems in new and old cardiac patients in outpatient department, and (6) use and interpretation of graphic methods. Craige, Harper, Griggs, Foster, Sorrow, Woods, Young, Simpson, Gettes, Sheps, Willis.

AHEC 406. ACTING INTERNSHIP — MEDICINE — NASH GENERAL HOSPITAL. Students will serve as acting interns in the Nash General Hospital under the supervision of clinical faculty who are in the private practice of Internal Medicine in Rocky Mount. The student will be assigned selected patients who are hospitalized under the care of the responsible clinical faculty member and other hospitalized patients who are of particular teaching value. For these patients, the student will be given appropriate responsibility in terms of assuming responsibility for ordering diagnostic evaluation, writing orders, etc. The opportunity will also be made available for the student to actively participate in the Emergency Services of the hospital. Faculty: Clinical faculty at Nash General.

406. CLINICAL CARDIOVASCULAR PHYSIOLOGY (6). Prerequisite: completion of all clinical clerkships. This elective is concerned with applied physiology of the cardiovascular system. Special emphasis is placed on correlation of physical signs with hemodynamic and angiographic findings at cardiac catheterization. The student participates as a contributing member of the cardiac catheterization team. He has the opportunity to work-up, examine and present patients pre-catheterization, to interpret and relate the data obtained at catheterization to the patient's symptoms and signs, to enter the decision making process regarding therapy and to follow many of the patients through cardiac surgery. Considerable free time is provided for in-depth reading in topics of the student's choosing. Popio, Noneman, and Cardiac Fellows.

AHEC 407. ACTING INTERNSHIP — MEDICINE — NEW HANOVER (PRIVATE SERVICE). The student will serve as an acting intern on the medical service at New Hanover Memorial Hospital, serving as a physician to patients with both acute and chronic medical problems. The student will be assigned to Team P which consists

primarily of private patients who are admitted by private attendings. Team P consists usually of a first and second year medicine resident, along with the AI under the supervision of the private attending who is a member of the teaching clinical faculty. The course offers an opportunity for students to learn and experience practical clinical medicine. Students work closely with housestaff and attending physicians in the care of these patients. All conferences, seminars, and rounds will be open to the students. Faculty: Dr. Werk and clinical faculty at New Hanover and UNC.

407. DIGESTIVE DISEASES AND NUTRITION (GASTROENTEROLOGY) (6). Prerequisite: third year clerkship in medicine. The clinical aspects of gastroenterology, hepatology, and nutrition are emphasized in this elective. Special attention is paid to the biochemical and physiologic bases for diagnosis and treatment. Students observe and, where appropriate, perform specialized procedures such as endoscopy, secretory studies (gastric and pancreatic), biopsy and radiography. Experience is gained in the interpretation of x-rays and histologic slides of both bowel and liver. A learning center is available which includes a teaching microscope plus equipment for viewing collections of histopathology, tape-slide programs and microfilms. The student participates daily in consultation rounds and works one-half day a month in the GI outpatient department. Sessions, Drossman, Bozymski, Heizer, Powell, Lesesne, Orlando, Nuzum, Levinson, Sandler, Sartor.

408. HEMATOLOGY (6). Prerequisite: senior medical students (juniors by arrangement). Designed to give students a broad coverage of as many aspects of clinical hematology as possible. Students will have ample opportunity to learn the techniques of bone marrow aspiration and biopsy and other laboratory tests of value in the diagnosis of hematological diseases. Students will be given an opportunity to explore particular interests in coagulation, blood banking techniques, or other diagnostic laboratory methods in Hematology. Senior staff.

409. MEDICAL EMERGENCIES (6). Prerequisite: completion of all clinical clerkships. Under the supervision of the medical attending and house staff, the student will be exposed to the various problems presenting as emergencies. The diagnosis, and management of such problems as cardiac arrhythmias, shock, pulmonary edema, diabetic acidosis, bronchial asthma, respiratory insufficiency, pulmonary embolism, etc., will be reviewed as patients with these disorders present themselves to the Emergency Department. Every third night assignment to the Emergency Room is an integral part of the rotation. A careful review of all cases worked up by the student will be made by the medical attending or resident, with further teaching taking place at daily review conferences. Attendance at a daily (5 days/week) EKG course is expected unless already taken while on cardiology. E.R. Medical Attending Staff.

410. AMBULATORY MEDICINE (6). Prerequisite: completion of all clinical clerkships. The senior medical student is afforded an opportunity for clinical experience in the Medical OPD of NCMH, and in the clinics of Orange-Chatham Comprehensive Health Services in rural Chatham County. Under the supervision of faculty from the Department of Medicine, the student will assume primary responsibility for three or four complete consultation evaluations per week at NCMH. This experience will be complemented by one day of clinical experience in OCCHS where the emphasis will be on acute common problems seen on a walk-in basis and on chronic continuing care of long term problems. Each student will visit the Carol Woods Retirement Center and Nursing Home and a Hospice Team Meeting. Daily seminars will address relevant issues in ambulatory care such as management of common acute and long term problems, health screening, economic realities of care, system of medical care services, etc. Byran, Hoole, Pickard, and staff.

411. DIAGNOSIS AND MANAGEMENT OF INFECTIOUS DISEASES (6). Prerequisite: completion of all clinical clerkships. The primary objective of the program is to provide an educational environment in which students learn diagnostic approaches

relevant to infectious diseases as well as the clinical and laboratory basis of antibiotic therapy. Opportunities to learn the principles of clinical microbiology applied to the physician's office are made available. The functions of the infectious disease consultant and hospital epidemiologist will be demonstrated. Students will work as active members of the infectious disease group providing consultative services in the North Carolina Memorial Hospital. The elective provides the opportunity to study in depth selected patients with infectious diseases in order to develop the skills required for effective diagnosis and treatment. Lemon, Sparling, Fischer, Cohen and Fellows.

412. ENDOCRINOLOGY (Pediatrics 412) (6). Prerequisite: completion of all clinical clerkships. Extensive clinical experience is obtained with patients with endocrine disorders in the Medical Endocrine and Diabetes Clinics and in the Pediatric Endocrine Clinic. New patients are seen in the clinics and discussed with members of the Medical or Pediatric staff. Inpatients are seen on consulting rounds in the main hospital and in the Clinical Research Unit. Problem-solving exercises are conducted on Tuesday and Friday afternoons with one of the faculty. Ontjes, Gray, Van Wyk, French, Underwood, Earp, Gwynne, Clemmons, Utiger, D'Ercole.

413. NEPHROLOGY (Pediatrics 413) (6). Prerequisite: completion of all clinical clerkships. Designed to provide an inpatient and an outpatient experience in the broad area of nephrology. In addition, it will include a program of supervised reading and tutorial sessions designed to meet the particular interests and needs of the student involved. Students may have the opportunity to learn something about the special techniques of nephrology including: renal biopsy (along with an understanding of the indications and interpretation), the use of the artificial kidney, peritoneal dialysis, and some of the common lab procedures. Students will work in the outpatient department where they will see patients with nephrologic problems, and each student will "work-up" approximately three "inpatients" a week. Blythe, Colindres, Gitelman, Lassiter, Mattern, W. Finn.

414. PULMONARY MEDICINE (6). Prerequisites: completion of all clinical clerkships. Activities will consist of: (a) review of respiratory physiology, (b) clinical and laboratory diagnosis of pulmonary diseases including such special techniques as pleural biopsy, bronchoscopy, (c) applied respiratory physiology and evaluation of lung function, (d) general and special therapy in pulmonary medicine including acute and chronic bacterial infections, tuberculosis and mycoses. Emphasis will be given to comprehensive care of patients with disabling lung diseases, and whenever possible, this will include experience in acute respiratory care and instruction in the use of respiratory devices, respirators, etc. Barnett, Battigelli, Eldridge, Bromberg, Boucher, Donohue, Friedman, Knowles, Ranga, Boehlecke.

415. CLINICAL RHEUMATOLOGY AND IMMUNOLOGY (6). Prerequisite: completion of medicine clerkship. This elective is designed to provide the student with the clinical skills and knowledge required for differential diagnosis, evaluation, and management of patients with connective tissue diseases. Emphasis is placed upon the radiographic and clinical diagnosis of common types of arthritis, use of immunologic tests, and the rationale underlying choice of therapy modalities. Participation includes 3 days of Arthritis Clinic, an optional additional day of Arthritis Clinic at an AHEC hospital, and work-up of patients seen by consultants at NCMH. Winfield, Yount, Hadler, Eisenberg, Sauter, Cohen, Ross, Newman, and Berger.

416. CLINICAL NUTRITION (6). Prerequisite: completion of all clinical clerkships. Clinical course to teach the practical aspects of nutrition support for hospitalized patients. Consists of rounds — 2 hours daily, 5 days a week (optional 6 or 7 days per week) — with the nutrition support nurse. Number of patients being followed by the service at any one time varies from approximately 5 to 15 and the student can expect to work up and write a consult note under supervision for at least 1 patient per week. In addition, the student is expected to read background material which has been selected for the course in addition to reading and reporting on a few specific articles relating to

patients being seen. Material covered includes the practical aspects of nutrition assessment, nutrition support (oral, enteral, and parenteral), and prevention and treatment of vitamin, trace element, and essential fatty acid deficiencies. Surgical and medical patients, including some patients with cancer, are covered. Heizer, Nuzum, Hak, Raasch, Brown.

417. CLINICAL PHARMACOLOGY CONSULTATIONS (6). Prerequisite: completion of all clinical clerkships. A team (consisting of a fourth year student, resident in Clinical Pathology and/or Medicine or Pediatrics, clinical pharmacist, and an attending physician) will see patients with drug-related problems (drug overdose, drug-dosing problems, adverse drug reactions). Conferences and rounds will be held daily to present and discuss clinical pharmacokinetics, the utility of serum drug levels. A syllabus will be provided. Rogers, Cubeddu, Powell.

418. PROBLEMS IN CLINICAL PHARMACOLOGY AND THERAPEUTICS (6). Prerequisite: completion of all clinical clerkships. This elective offers the student a unique opportunity to explore the medical literature in depth in order to formulate therapeutic approaches to common and vexing clinical problems. The course will consist of 5 2-hour seminars weekly with a faculty member of the Department of Medicine or Pharmacology; at each seminar the student will be asked to select a drug-related answer. Emphasis will be placed on thoughtful, critical evaluation of the relevant literature. Sample questions: (1) Factors governing the selection of a sedative hypnotic agent; (2) Antibiotic choice and dosing in patients with renal or liver disease; (3) Dosing of digoxin in the patient with normal or impaired renal function; (4) Rational use of analgesics-drug selection and dosing; (5) Management of drug overdose. A series of didactic lectures on statistics, pharmacokinetics and clinical trials will also be offered. Rogers, Cubeddu.

MEDI 419. INSTRUCTION AND EVALUATION IN MEDICAL EDUCATION (var.). (FMME 413). Prerequisites: completion of first year and permission of instructor. This elective has been designed for the student who is considering a career in medicine that involves some teaching. The elective will be structured individually depending upon the student's specific interest, but it will center on participation in some type of instructional development, teaching, and/or evaluation project. Various aspects of the new curriculum, general educational research and development and/or educational uses of the computer are potential focii. It is likely that the student will want to conduct his/her own project in consultation with an adviser from a basic science or clinical department and a faculty member from the Office of Research and Development for Education in the Health Professions (ORDEHP). The project might focus on possibilities for particular courses and programs such as (1) assessing and determining instructional needs; (2) analysis of instructional resources for developing or improving a program; (3) determining and designing a program's instructional goals or objectives; (4) designing instructional media; (5) determining and developing an appropriate teaching strategy; (6) developing student self-assessment approaches; (7) developing computerized simulations for teaching and evaluating, or (8) designing and implementing evaluation methods. For more information, contact Dr. Frank Stritter, Director, ORDEHP at 966-3641.

420. SEMINAR: ECG INTERPRETIVE (0). Prerequisite: completion of all clinical clerkships. The course is designed to instruct the medical student in the approach to interpretation of the electrocardiogram. Selected tracings, arranged in groups showing specific types of ECG abnormalities will be discussed from 8:00 to 9:30 A.M. each weekday — the students will be expected to study the tracings the night before, using standard texts as aids. The elective will be offered monthly. Permission to attend must be granted by directors of other electives being taken concurrently. Division of Cardiology.

421. ADVANCED TOPICS IN PARASITOLOGY (0). Prerequisite: completion of first year microbiology course. A seminar course expanding on the curriculum's basic course. International as well as domestic parasitic infections will be discussed, with an emphasis on clinical presentation, accurate diagnostic methods, and efficacy of treatment. Davidson, Weatherly.

424. SEMINAR: ACUTE EMERGENCIES IN PULMONARY MEDICINE (0). Prerequisite: completion of all clinical clerkships. The goal of this seminar is to increase student learning opportunities in pulmonary medicine. At the conclusion of the course, the student should be familiar with the work-up, assessment, and treatment of patients with (1) status asthmaticus; (2) acute respiratory failure; (3) pleural effusion and pneumothorax; (4) bacterial pneumonia; (5) near-drowning; and (6) inhalational injuries due to fire. Emphasis will be placed on student problem-solving. Each week a 2-hour session will be held in which the group will work through patient management problems utilizing case studies encountered at the North Carolina Memorial Hospital. Donohue.

429. SEMINAR IN INFECTIOUS DISEASES (Pediatrics 424) (0). Prerequisite: completion of first year medical school microbiology course. A lecture and discussion course on practical problems of infectious disease diagnosis and management. Primary emphasis will be given to those illnesses commonly encountered in routine clinical practice. Pharmacology and physiology will be included as needed to formulate rational therapeutic plans. Algorithms will be developed for several clinical problems. Fischer, Clyde; members of Med-Peds Infectious Disease Groups.

432. ACTING INTERNSHIP — MEDICINE — CHARLOTTE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. This rotation emphasizes primary patient care involving a blend of inpatient and outpatient experiences. The medical student functions as an acting intern on one of three ward services. He will experience primary responsibility for the care of his assigned patients under the supervision of a junior resident and a full-time attending. Required conferences include daily subspecialty lectures, ECG conferences three times weekly, and weekly grand rounds. He or she will attend the general medicine outpatient clinic every third weekday. This provides a means of developing skills for the efficient management of acute and chronic illnesses as seen in the office of a general internist. McCall, Frazier, Baucom, and Shellhorse.

436. ACTING INTERNSHIP, CLINICAL RESEARCH CENTER (6). Prerequisite: Completion of the third year medicine clerkship. This acting internship is on the Clinical Research Unit of the North Carolina Memorial Hospital. Students on this service have an unusual opportunity to carefully and thoroughly study patients with selected diseases participating in various research projects under the guidance of the principal investigators. Students may participate in established clinical research projects or develop and conduct a project of their own under the supervision of appropriate faculty. Daily rounds and conferences are conducted by Dr. Robert Utiger and associates. Faculty of the Department of Medicine.

437. ACTING INTERNSHIP, COMMUNITY HOSPITAL INTERNAL MEDICINE, TARBORO CLINIC, AND EDGECOMBE GENERAL HOSPITAL. (6). Prerequisite: completion of all clinical clerkships. The acting internship is designed to acquaint the student with the scope of services for which a general internist is responsible. The student will work in the Tarboro Clinic group practice facility during the day, and will take night call in association with his attending physician. He will be responsible for the initial history and physical on those patients whom he encounters who require admission and he will be responsible with the admitting physician for their follow-up during the hospitalization. Daily teaching rounds on the inpatient service will be conducted by members of Tarboro Clinic staff. Opportunities will also be made available to the student to spend brief periods of time in other health facilities in the community such as the health department, social service office, solo practitioners' offices, satellite

clinics, and local mental health facility. The student will also participate in weekly teaching conferences of the clinic and hospital. Whaley, Brooks.

438. ACTING INTERNSHIP, NASH GENERAL HOSPITAL. (6). Prerequisite: completion of all clinical clerkships. Students will serve as acting interns in the Nash General Hospital under the supervision of clinical faculty who are in the private practice of internal medicine in Rocky Mount. The student will be assigned selected patients who are hospitalized under the care of the responsible clinical faculty member and other hospitalized patients whose presentation or course of illness provides valuable teaching examples. For these patients, the student will be given appropriate responsibility in terms of assuming responsibility for ordering diagnostic evaluation, writing orders, etc. The opportunity will also be made available for the student to spend time in the physician's private office and to participate in the Emergency Services of the hospital. Clinical faculty at Nash General.

439. EMERGENCY MEDICINE, CHARLOTTE (6). Prerequisite: completed medicine, pediatrics and surgery clerkships. Medical students are expected to complete at least 20 educational days on the rotation. The rotation will introduce the student to the clinical practice of Emergency Medicine. By the end of the rotation the student will: 1) Have been exposed to a wide spectrum of emergency and non-emergency problems; 2) Recognize that the patient defines the emergency; 3) Understand how the emergency department relates to other departments and services; 4) Develop and improve skills in suturing, interpretation of radiographs and electrocardiograms, establishing IVs, cardiopulmonary resuscitation, lumbar puncture, etc.; 5) Develop the ability to quickly determine the relevant history and physical with selective use of ancillary services to achieve the most efficient and effective emergency assessment and management. Students are expected to attend all conferences sponsored by the Department of Emergency Medicine during their rotation. Baker, Ford, Sutton, Whitlock, Schafermeyer.

440. INTERNAL MEDICINE, RUTHERFORD HOSPITAL, RUTHERFORD, N.C. (6). Prerequisite: completion of all clinical clerkships. The clerkship at a 170 bed general hospital and adjacent clinic is supervised by internal medicine faculty representing several subspecialties. Each student is assigned one or two internists as his or her main preceptors, but much of the staff will share instructive cases and procedures. Supplementary experience in pediatrics, gynecology, radiology, orthopedics, urology, dermatology, and general surgery may be tailored to the student's interests; however, primary educational responsibility resides in the Department of Medicine. Drs. Jaski, Harding, Hyde, Mebane and Shapiro in Medicine, plus approximately 10 physicians in other fields.

441. RESEARCH IN HEMATOLOGY/ONCOLOGY - BIOPHYSICS OF LEUKEMIC CELL SURFACES (var.). Prerequisite: admission to Medical School. This course is designed to give students with previous research experience detailed exposure to advanced methods in application of biophysical methods, light scattering, rheology, NMR, etc. to the investigation of abnormalities of cell surface. The course will include clinical exposure to patients with leukemia: clinical evaluation/treatment/research (clinical) protocols. The student will learn how to process/isolate/purify various cell lines and cell derivation. In addition these reagents will be studied using a variety of advance biophysical methodology. Hematology/Oncology faculty.

442. CARE OF THE ELDERLY PATIENT (CLINICAL GERIATRICS) (6). Prerequisite: completion of third year medicine clerkship. In this clerkship, the student will be expected to develop skills in (a) communicating with elderly patients and their families; (b) evaluating their physical, emotional, social and economic abilities to cope with the normal activities and stresses of daily living; (c) assessing the causes of common problems among the elderly (including delirium, dementia, falls, depression, incontinences); and (d) working with patients, families, health professionals from many disciplines and community agencies to develop rehabilitation goals and implement appropriate care plans. Selected geriatric patients will be evaluated and followed in the clinics and

wards of North Carolina Memorial Hospital and Wake County Medical Center, utilizing interdisciplinary team home visits, rounds in nursing homes, and conferences. Beck, Bryan, Dascomb, Halperin, Lyle, Sloane and Program on Aging Interdisciplinary Staff.

443. MEDICAL GENETICS (6). Prerequisite: completion of all clinical clerkships; or by permission of Drs. Kirkman and Swift. The student will participate in genetic consultations on the wards and in the clinics and in the evaluation and counseling of patients (approximately 500 yearly) seen in the genetic counseling clinics. Supervised participation is also possible in the counseling and diagnosis of patients having antenatal diagnosis (approximately 600 yearly). Each student may work with patients on either the adult medical or pediatric services, or both. At least two weeks before the rotation, the student should notify both Dr. Swift and Dr. Kirkman of the preferred distribution of time between the two services. The student may choose to make field trips to study a family with a genetic disorder, to learn cytogenetic techniques, to read selected topics in medical genetics under supervision, or by special permission, to undertake a research project. Aylsworth, Kirkman, Swift and staff.

444. CLINICAL EXPERIENCE IN COMMUNITY MEDICAL PRACTICE (6). Prerequisite: completion of all clinical clerkships. Students seeking community-based preceptorships not available in the catalogue should submit their proposals to the course director. Many North Carolina settings for general internal medicine or subspecialty practice are eligible for elective credit through Medicine 444. Participating students will share with their preceptors the daily tasks of caring for patients seen in both office and hospital practice. Emphasis will be placed on increasing the student's skill in diagnosing and treating those conditions most commonly encountered in these settings. In addition, guidance will be offered in analyzing the determinants of effective medical care and in linking the problems of individuals to those of the community in which they live. Nuzum.

446. CLINICAL GASTROENTEROLOGY, NEW HANOVER MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. Opportunity is afforded for students to learn continuous care and management of patients with common gastroenterological disorders. Hospital, clinical and private office patients will be assigned and the student will assume responsibility in the patient's initial and subsequent therapy. Emphasis will be placed on gastroenterological procedures and endoscopy. Daily teaching rounds will be conducted. Specific afternoon time will be spent in private offices. Regular conferences and assigned reading will provide the student with in-depth prospective of current views on management and disease mechanisms. Wilkins, Rust, Shuford, Meyer.

447. CLINICAL CARDIOLOGY, NEW HANOVER MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. Students will work with a medicine resident, under the supervision of a full-time faculty cardiologist. They will participate actively in the evaluation and management of in-patients seen in consultation. Emphasis is placed on in-depth study and discussion of clinical problems. Opportunity is provided to improve skill in electrocardiography and to gain experience in non-invasive laboratory methods. In addition, there is limited exposure to procedures employed in the care of critically ill patients. Robinson.

448. CARDIOLOGY, CHARLOTTE MEMORIAL HOSPITAL. (6). This is a selective rotation in cardiology. Student experiences will consist of coronary care unit patients, evaluation of cardiac patients in the emergency department, attendance at biweekly cardiology clinic, and optional participation in a very active invasive cardiology laboratory. The student will function as an acting intern. This will include call responsibilities. By special arrangement with Mary Baucom, M.D., Charlotte Memorial Hospital.

449. CRITICAL CARE MEDICINE (6). Prerequisite: completion of all UNC clinical clerkships, proven proficiency during the medicine clerkship and permission of course director. An elective for fourth year students is offered in critical care medicine. The student will work in the North Carolina Memorial Hospital Medicine and Pulmonary Intensive Care Units. Student responsibilities will include staying in the hospital every second night. The student will be assigned to an intern and work directly with the intern as a member of the intensive care unit team in the evaluation and care of all MICU and PICU admissions. The course will include review of an experience in general medicine and specialized respiratory intensive care. The student will be exposed to invasive hemodynamic monitoring techniques and mechanical ventilator management. Correlations between patient data and physiology and pharmacology will be stressed. Mitchell Friedman, M.D. (Director) and MICU and PICU attending and fellow staff.

450. CORONARY CARE UNIT (6). Prerequisite: completion of all clinical clerkships. An elective for fourth year students is offered in intensive coronary care. The student will work in the North Carolina Memorial Hospital Coronary Care Unit. Student responsibilities will include staying in the hospital every second night except for Saturday and Sunday. Student will work-up, write-up, present and provide a major portion of the care for selected admissions. The student will participate actively in the evaluation and care of all admissions. The course will include review of and some experience in basic CPR, advanced life support, and general intensive care. The student will be exposed to invasive hemodynamic monitoring techniques, to cardiac pacing, to HIS Bundle electrocardiography and to Holter monitoring. There will also be an opportunity for interested students to participate in out-of-hospital patient care with the South Orange Rescue Squad under the supervision of a physician or nurse preceptor. Cardiology faculty.

451. ACTING INTERNSHIP, FAYETTEVILLE VETERANS ADMINISTRATION HOSPITAL. (6). Prerequisite: completion of all clinical clerkships. The student will work with a preceptor, an experienced general internist or, at his or her election, a cardiologist, chest physician, or gastroenterologist, in a one-to-one relationship. Selected in- and outpatients will be assigned to him for work-up and management for which he or she will be given progressively increasing responsibility in accordance with his or her ability. Special emphasis will be given to the development of basic skills in history taking and physical examinations, and, if a subspecialty is elected, to the techniques involved. Sachs, et al.

452. RESEARCH IN CLINICAL IMMUNOLOGY (24). Prerequisite: completion of first year of medical school. This elective offers an opportunity for laboratory research experience in areas relevant to immunologic bases for human disease and immunopathogenesis of tissue injury; autoantibodies, complement system, lymphocyte surface receptors and lymphocyte subpopulations, cellular immunity, immune complexes, immunopathology, immunogenetics, and immunoglobulin structure. Winfield, Yount, Hadler, Eisenberg, Ross, Cohen, Newman.

453. ALCOHOL AND DRUG ABUSE: THE PHYSICIAN'S ROLE (6). Prerequisite: completion of clerkship in medicine, surgery, pediatrics, or psychiatry. This four week medical clerkship in a 28-day alcoholism treatment program features management of acute and chronic medical and psychiatric problems as they accompany alcohol and drug addiction and withdrawal states. Opportunity is also provided for participation in non-medical aspects of the recovery process. The course is designed to address AMA guidelines for physician involvement in early recognition and appropriate treatment of problems of alcohol and other drug abuse, emphasizing the matching of community resources to patients' needs, and the physician's responsibilities in prevention, diagnosis, early intervention, and case management. Shaver.

455. RESEARCH IN ENDOCRINOLOGY (6). Prerequisite: admission to medical school and permission of desired faculty preceptor. Course designed to give the student experience in the experimental approach to solving questions in basic or clinical endo-

crinology. During the elective the student will work closely with an individual faculty member on a research problem of mutual interest. Students will be expected to plan and carry out appropriate experiments or clinical studies and to write a summary of the results. There will be ample opportunity to participate in conferences and seminars in the Endocrine Division. Clemmons, Gray, Gwynne, Earp, Utiger.

456. INTERNAL MEDICINE, HALIFAX MEMORIAL HOSPITAL. (6). Prerequisite: completion of all clinical clerkships. The location for this experience within Area L will be Halifax Memorial Hospital in Roanoke Rapids, NC. This is a 190 bed general hospital located in a town of approximately 20,000. This experience is designed to acquaint the student with the scope of services for which the general internist is responsible. The student will be responsible for following the patient from admission to discharge, and will be given ample time for patient contact. This would include contact in the emergency room. The student may choose within the specialties of internal medicine among the following three tracks: (1) general internal medicine with experience in office, hospital, clinic and medicine consultation; (2) general internal medicine with experience in gastroenterology in the office practice, and also consultations with experience in endoscopy; (3) general internal medicine with experience in infectious diseases in the office, clinic, hospital and consultation. Opportunities can also be made available for the student to spend time in other health facilities within the community. Brown and Manlapas.

457. MEDICINE AT WILSON MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. Student will gain experience in all phases of multispecialty clinic practice and in the primary care of hospitalized patients. The student will have the opportunity to take supervised responsibility for his own clientele and will be permitted to perform or assist in performing technical procedures and professional activities at the discretion of and under the immediate supervision of the physician preceptor. A broad spectrum of rotation possibilities is available within the clinics and hospital depending on the interests of the student including: Hospital Administration, Nursing Administration, Hospital Department of Social Services, Myocardial Infarction Rehabilitation Program — In Hospitals, Learning Center — Patient Education, Utilization Review, Emergency Room, CCU-ICU, Cardiac Function Tests — ECG, Echocardiography, Stress Testing. Phelan, McCain.

458. CARDIOLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. This rotation is a preceptorship with one or more senior staff in cardiology. The student will participate in the work-up and management of hospitalized patients under the direct supervision of the resident and attending cardiologist. He will have the opportunity to observe cardiovascular diagnostic procedures, study electrocardiograms with the cardiologist-interpreter, participate in consultations, attend the pediatric cardiology clinic, and spend some time in the private office of a private attending cardiologist, participating in the management of ambulatory patients with cardiovascular disease. He will attend the general medical conferences and participate in Grand Rounds. Clinical faculty in cardiology.

460. ENDOCRINOLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. This rotation is a preceptorship with one or more practicing endocrinologists. The student may function as an intern with inhospital patients having endocrinology problems, performing initial work-ups and participating in management of patients under the supervision of a medical resident and a senior endocrinologist. He will also accompany the resident and endocrinologist on consultations in the hospital and may spend some time in the private office of the practicing endocrinologist participating in the evaluation and management of ambulatory patients. He will attend the general medical conferences and lectures and will participate in Endocrinology Rounds. Clinical faculty in endocrinology.

461. INFECTIOUS DISEASES, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisites: completion of all clinical clerkships and by arrangement with the in-

structor. This elective is a one-month rotation that exposes the student to the full range of clinical infectious diseases. The rotation is under the direction of Dr. Timothy Lane and Dr. Jack McCue, both members of the full-time faculty, and associate directors. The core of the experience will be consultations on hospitalized patients primarily at Moses Cone Hospital but also at other hospitals in the community. The student will receive teaching from a medical resident as well as the usual daily attending rounds and a series of didactic lectures designed to review and update the major topics in clinical infectious diseases. The student will initially examine and present new patients to the attending and will be expected to follow the progress of such patients through daily "work" rounds conducted in conjunction with the medical resident. Several sessions in the bacteriology laboratory will be arranged so the student can become familiar with relevant microbiologic methods. A monthly infectious diseases conference and a monthly case management discussion will be the joint responsibilities of the student, the medical resident, and the attending. Lane and McCue.

462. HEMATOLOGY-ONCOLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. The student will be assigned selected patients with hematologic and oncologic disorders and will participate in their work-up and management under the direct supervision of the resident and attending hematologist-oncologist. He may also spend some time in the private office of practicing hematologist-oncologists and participate in the management of ambulatory patients. He will also attend the weekly hematology-oncology clinic, the general internal medicine conferences, and will participate in hematology-oncology rounds. Senior staff in hematology-oncology.

463. GASTROENTEROLOGY, MOSES H. CONE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. This rotation is a preceptorship with practicing gastroenterologists. The student will participate in the work-up and management of hospitalized patients with GI problems, under the supervision of resident and attending gastroenterologist. The student will review X-rays with the attending and observe numerous GI procedures. The student may spend part of his time in the private offices of practicing gastroenterologists, participating in the evaluation and management of ambulatory patients with GI disorders. The student will attend the general medical conferences and participate in GI rounds. Clinical faculty.

465. ACTING INTERNSHIP - WARD MEDICINE, NORTH CAROLINA MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships and permission of the program director in Internal Medicine. Students will serve as acting interns on the medical services of North Carolina Memorial Hospital. They will assume the duties and responsibilities of an intern under the supervision of a medical resident and an attending physician. Night call is every third night. Students can expect to be exposed to a wide range of acute medical problems. This elective does not fulfill the requirement for an acting internship sponsored by the AHEC Program in a community hospital.

466. OCCUPATIONAL LUNG DISEASE (6). Prerequisite: admission to medical school. The purpose of this elective is to broaden the students' experience in occupational lung disease by providing them with clinical or research opportunities. The student will work directly with faculty of the department who are involved in ongoing projects. When possible, the student will engage in independent work related to the faculty project or participate in field experiences in occupational medicine. The student will prepare either a written or oral report of the work completed at the end of the four week elective. Battigelli, Boehlecke, Bromberg.

467. ADVANCED CARDIAC DIAGNOSIS (6). Prerequisite: completion of all clinical clerkships. This course will emphasize the important role of historical and physical findings in the diagnosis of heart disease. Noninvasive studies including phonocardiography, pulse recordings, electrocardiography, chest x-ray and echocardiography will be used to elucidate the bedside findings particularly in patients with congenital and valvular heart disease. The goal of this elective is to provide an oppor-

tunity for the student to speak with and examine a large number of patients who have abnormal physical findings, correlate the non-invasive studies and through the process, improve their bedside diagnostic skills. Willis and Cardiology Faculty.

## THE DEPARTMENT OF MICROBIOLOGY

105. MOLECULAR AND CELLULAR BASIS OF PROKARYOTIC MICROBIOLOGY (4). See page 160 for complete description.

110. IMMUNOLOGY (3). See page 160 for complete description.

114. MICROBIOLOGY AND IMMUNOBIOLOGY (3) See page 160 for complete description.

115. SPECIAL TOPICS IN BACERIOLOGY AND IMMUNOLOGY (var.). See page 160 for complete description.

120. MICROBIAL PATHOGENESIS (4). See page 160 for complete description.

130. VIROLOGY (4) See page 161 for complete description.

210.TUTORIAL IN MICROBIAL CHEMISTRY (3). See page 161 for complete description.

211. TUTORIAL IN ANIMAL VIROLOGY (3). See page 161 for complete description.

212. TUTORIAL IN IMMUNOLOGY (3). See page 161 for complete description.

## THE DEPARTMENT OF NEUROLOGY

402. NEUROLOGY RESEARCH (6). Prerequisite: two years of medical school. Research in neurology either within the Department of Neurology or in connection with one of the preclinical departments. Nature of the research activity will be arranged to fit the needs of the student. Staff. Permission required from Drs. Hayward or Mann.

403. CLINICAL NEUROLOGY (6). Prerequisite: completion of third-year medicine clerkship. Students will participate in the work-up and management of patients with disorders of the nervous system under the direct supervision of a neurology resident and attending on the consultation service. Most of the patients assigned to the students will be inpatients. One day per week will be spent working in the adult neurology outpatient unit. The student will also have an opportunity to observe and learn about diagnostic neurologic procedures. Time is provided for attendance at the department of neurology teaching conferences. The precise program can be modified to some extent to fit the needs of the student. Four students each elective period. Staff.

405. CLINICAL NEUROLOGY-GREENSBORO (6). Prerequisite: completion of third-year medicine clerkship. This rotation is a preceptorship with practicing neurologists. The student will participate in the work-up and management of hospitalized patients with neurologic disease under the direct supervision of a medical resident and neurology attending. The student may attend consultations with the resident and senior neurologist and will have the opportunity to observe diagnostic neurologic procedures. He or she may spend some time in the private office of the attending neurologist participating in the management of ambulatory patients with neurologic disorders. The student will attend the general medical conferences and lectures. Stiefel, staff.

410. PEDIATRIC NEUROLOGY (6). (PEDIATRICS 410). A broad-based introductory course in the major clinical problems encountered in childhood neurology is offered. In the outpatient clinic the student will be exposed to the problems of developmental disorders, learning difficulty and seizure disorders. Experience on the inpatient services includes exposure to primary neurological diseases and neurological complications of common pediatric illnesses. Some emphasis will be laid on giving the student an adequate exposure to the newer aspects of neurologic investigation. Greenwood, staff.

## THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

402. MATERNAL-FETAL MEDICINE ELECTIVE (6). This elective provides the student with an indepth exposure to the evaluation and management of patients with high-risk pregnancies. The student attends prenatal diagnostic clinics which include ultrasound, amniotiocentesis, and fetal heart rate monitoring and participates in all related conferences and perinatal rounds. In addition the student is expected to perform a literature review and give a presentation of a topic in maternal/fetal medicine.

412. GYNECOLOGIC ONCOLOGY (6). Students will work closely with chief resident and attending in Tumor Clinic. They will also work in the Dysplasia Clinic held two hours each week. Students will observe, and when possible, participate in gyncancer operations. They also will be encouraged to become involved in some projects in the Tumor Registry. Weekly review of pathology slides will be supervised. Fowler, Currie, Walton; staff.

AHEC 412. ACTING INTERNSHIP/CHARLOTTE MEMORIAL HOSPITAL (6). The student will function at an increased level of responsibility as compared with the third year clerkship. Emphasis may be placed on obstetrics, gynecology or outpatient experience as desired by the student. This course offers an excellent opportunity to participate in the practice of obstetrics and gynecology in a large community hospital. Room and board will be furnished by Charlotte Memorial Hospital. Rimer, Hisley, Hall; staff.

413. COMMUNITY OBSTETRICS AND GYNECOLOGY (6). This elective is a preceptorship in a three-person OB/GYN practice in a rural community. The faculty members are experienced academicians, familiar with high standards of education and patient care. The student will participate in the evaluation of patients in the office setting as well as assist the physicians in hospital rounds, surgery and labor and delivery in the community hospital.

AHEC 414. ACTING INTERNSHIP/NEW HANOVER MEMORIAL HOSPITAL (6). As an acting intern in this community hospital, the student will have the opportunity to observe and experience obstetrics and gynecology as practiced in a community of this size. Although the program is designed to provide the proper balance between the clinical and academic training in both inpatient and outpatient obstetrics and gynecology, it can be redesigned to emphasize the needs and desires of the student. The student will function under the direct supervision of the attending staff, but will work with and for the residents as part of the health care team. Rieman, Daley and Staff.

414. ACTING INTERNSHIP/NAVAL REGIONAL MEDICAL CENTER, CAMP LEJEUNE (6). The student's responsibilities on this elective will be split between outpatient gynecology and obstetrics, with night call on the obstetrics ward.

The predominant time will be spent on outpatient gynecology service seeing routine problems. The student will be able to participate in selected surgery cases as desired, and will participate in management of high risk obstetrics patients. Welham and staff.

## THE DEPARTMENT OF OPHTHALMOLOGY

401. ADVANCED CLINCIAL OPHTHALMOLOGY (6). During the fourth year several students at their election may spend four weeks in ophthalmology, utilizing the inpatient and outpatient facilities of North Carolina Memorial Hospital, working with the staff and residents in their day to day care of inpatients and outpatients. Eifrig, Grimson, Cohen, Merritt, Peiffer, Chang; staff.

402. RESEARCH IN OPHTHALMOLOGY (var.). Carefully selected students carry out individual research projects and assist members of the staff on selected problems.

403. INTRODUCTION TO OPHTHALMIC PATHOLOGY (2). Students will attend didactic lectures and seminars on eye pathology and learn gross and histopathologic interpretive skills. Peiffer, Hale, Lipper, Moore.

404. BASIC SCIENCE FOUNDATIONS OF OPHTHALMOLOGY (2). Basic ophthalmic sciences including embryology, anatomy, physiology, biochemistry, pharmacology and immunology will be presented by didactic lecture and student literature reviews. Peiffer and staff.

CONFERENCES

Students electing to serve during the third and fourth years attend rounds, conferences, and seminars held at North Carolina Memorial Hospital with the ophthalmic house staff and attending staff.

## THE DEPARTMENT OF PATHOLOGY

401. SURGICAL PATHOLOGY (12). Prerequisite: first two years of medical curriculum. Instruction and experience will be obtained in the following: the examination and diagnosis of surgical pathology specimens, the processing of tissues, the use of histochemical techniques, and gross and microscopic photographic methods. Participation in conferences and seminars and detailed study of one selected disease entity for oral presentation at Pathology Staff Conference will be expected. *Four times a year for two consecutive elective periods.* Askin; staff.

402. AUTOPSY PATHOLOGY (12). Prerequisites: first two years of medical curriculum and permission of instructor. This clerkship is equivalent to a two month acting internship in pathology with emphasis on anatomic pathology. Students will act as prosectors on the regular autopsy service, conducting gross and microscopic autopsy studies under supervision, and presenting their cases for discussion at staff seminars. Each student is expected to write full reports on 8 cases. *Two consecutive periods.* Dalldorf; staff.

403. HEMATOPATHOLOGY (6). Prerequisite: first two years of medical curriculum and permission of the instructor. The student in conjunction with the instructor will develop a course of study to best meet his career objectives. Ross; staff.

404. BLOOD BANKING (6). Prerequisite: first year of medical curriculum and permission of the instructor. Theoretical and chemical aspects of blood transfusion services, introduction to blood bank research methodology. Attend conferences at which patients who are blood bank problems will be discussed. Take night and weekend call with residents. Opportunity for specific laboratory projects if interested. Problem oriented sessions and simulations. Miller; staff.

405. NEUROPATHOLOGY (6). Prerequisite: first year of medical curriculum. Tutorial instruction will be offered to the student in reviewing the basic diseases of the nervous system using current neuropathology material from the autopsy, surgical and consultation services. This material combined with past case studies is an opportunity

for the student to explore in greater depth specific problems in neuropathology. Krigman.

406. HUMAN GENETICS AND CONSTITUTIONAL PATHOLOGY (6). Prerequisite: first year of medical curriculum. The program will consist of a reading course in current literature on human genetics, two-hour weekly meetings with instructor, and field work and/or laboratory analysis of family with a genetically determined disease. Graham.

407. EXPERIMENTAL CARCINOGENESIS (6). Prerequisite: first two years of medical curriculum. The exploration of factors concerned with the inception and natural history of neoplastic diseases. Pathogenesis, biological behavior, and response to therapy will be investigated by means of a combined experimental and seminar curriculum. The role of chemical agents, physical factors, viruses, and the modifying effect of genetic factors in the induction of cancer will be studied. Grisham, Kaufman.

408. BLOOD COAGULATION (6). Prerequisites: completion of all clinical clerkships. An intensive indoctrination on clinical and laboratory aspects of coagulation. There will be didactic lectures, seminars, lab time, and considerable patient contact. There will be nighttime and weekend call. Abundant reading material is available. Roberts and White.

409. IMMUNOHISTOCHEMICAL DIAGNOSIS OF SOLID TUMORS IN HUMANS (6). Immunoperoxidase studies in the last few years have revolutionized the practice of surgical pathology. The student will have the opportunity to learn this simple technique and how it is applied to the diagnosis of neoplastic diseases. The student will sit in on the morning surgical pathology conferences and can engage in a modest research project. For those individuals who would like to learn how to publish a research paper a more substantial project can be arranged. Siegal.

411. RESEARCH (6). Prerequisites: first year of medical curriculum and permission of the chairman of the department. Independent research conducted under the supervision of a senior staff member. The maximum number of students will depend upon the research projects and facilities needed as determined by the appropriate faculty member. Grisham; staff.

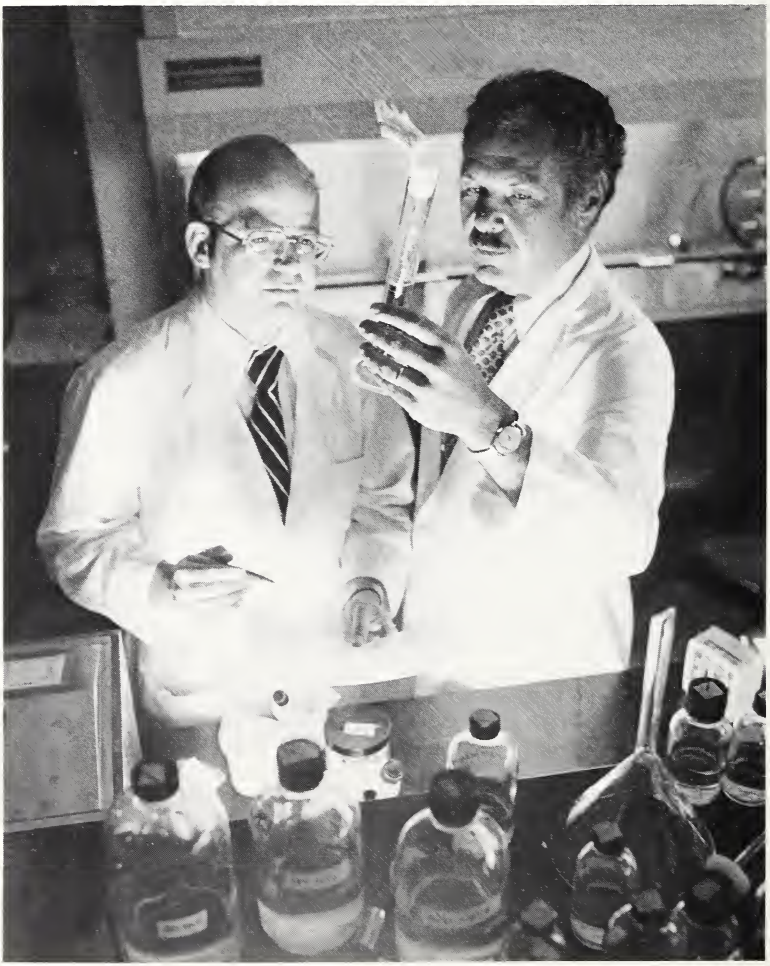
412. CASE ORIENTED LABORATORY MEDICINE — CLINICAL BIOCHEMISTRY (6). This elective will serve a dual teaching function: (1) to acquaint the junior-senior medical student with certain basic clinical biochemical principles and (2) to use these principles to analyze commonly occurring health related problems in terms of their biochemical components using the case-oriented approach. The format, case studies and self-assessment exercises, will be useful to those seeking an updating of their knowledge of clinical biochemistry and professional certification. Cases in multiple areas (eg. acid-base abnormal-ities, hormonal regulation, lipid metabolism, molecular genetics etc.) will be discussed from a critical point of view. Explanations and appropriate reference will be included to provide the student with more than empirical facts. Small group discussion will be encouraged and a participatory style of teaching rather than didactic lecturing will be used. Forman and associates.

416. FORENSIC PATHOLOGY (6). Prerequisite: completion of first year and permission of director. This clerkship is equivalent to a one month acting internship in pathology with emphasis on anatomic pathology. Students will assist medical examiners at medical legal autopsies and the associated toxicological and legal aspects of particular cases. This experience should provide opportunity to participate in all areas of medical legal science including the court room as well as the pathology laboratory. Hudson; staff.

417. DIAGNOSTIC LABORATORY MEDICINE (6). Prerequisite: completion of two year medical curriculum. Designed as an introduction to laboratory medicine. The approach is diagnosis of disease via resources of major areas of laboratory medicine.

Will cover the basic principles, methodologies, pitfalls, and limitations of selected laboratory tests. Major emphasis on development of skills in interpreting laboratory results. Also includes quality control, statistical tools, patient preparation, and drug interference with laboratory tests. *Period 8.* Ross and staff.

418. INTRODUCTION TO BIOMEDICAL COMPUTING (6). Offered in conjunction with the Curriculum in Biomedical Engineering and Mathematics. Basic introduction into the use of the computer as a tool in medicine including laboratory computerization, applications of the microcomputer in the medical office, the use and development of medical databases, statistical interpretation of data, and elementary real-time data acquisition techniques in patient monitoring. Students are expected to learn the basics of a computer language and will apply this skill toward a medically related application. *Period 1 or 3.* Chou; staff.



## THE DEPARTMENT OF PEDIATRICS

401. ACTING INTERNSHIP AT MOSES CONE HOSPITAL (6). On this elective the student will be assigned the full duties and responsibilities of a first-year resident including full patient work-ups, recording medical data and writing orders. Procedures will be supervised and orders will require countersignature. The majority of patient contacts will be with hospitalized children but some exposure to neonates and emergency room patients will occur. Ambulatory care assignments can be arranged including time in the office of a practicing pediatrician. The elective is intended primarily for those students planning a residency in pediatrics. Silber, Sharpless, Ravenel and staff.

402. PEDIATRIC CARDIOLOGY (6). The student will be involved with various types of congenital and acquired heart diseases as they occur in children on the wards and in a variety of outpatient settings. Attempts will be made to help the student organize into a meaningful fashion the manifestations of anatomic and physiologic abnormalities of the cardiovascular system. He will be expected to become proficient in physical diagnosis as related to the heart, as well as with the principles of electrocardiography, echocardiography and interpretation of cardiac x-rays. He will observe at cardiac catheterizations and participate in the interpretation of the data obtained. Specific topics will be discussed in seminars. Harned, Henry, Herrington, Schall.

403. ACTING INTERNSHIP AT NORTH CAROLINA MEMORIAL HOSPITAL. (6). The acting intern will function as all other interns on the Pediatric inpatient service—taking admissions in regular sequence and taking night call every third night. Supervision will be provided by a third year resident and the attending physician. Pediatric Inpatient Attendings.

404. ACTING INTERNSHIP: NEWBORN SERVICE INCLUDING NEONATAL INTENSIVE CARE — CHARLOTTE MEMORIAL HOSPITAL AND MEDICAL CENTER (6). Acting internship experience on the newborn service including Neonatal Intensive Care Unit is provided in a 901 bed teaching community hospital with approximately 300 deliveries per month, 48 term newborn beds, 35 neonatal intensive care beds, and 16 recovery neonatal. Specific activities include the following: (1) direct patient care experience with the term newborn infant and with high-risk infant with direct supervision from pediatric residents and full time faculty; (2) experience with resuscitation in the delivery areas with direct supervision and emergency stabilization of high-risk infants. This rotation provides experience with the newborn and neonate in a fully staffed and equipped regional perinatal center. Rathbun, Hickey, and Visser.

405. PEDIATRIC INFECTIOUS DISEASES (6). Experience is provided in both the basic and applied aspects of childhood infectious diseases. Working primarily with the specialty residents and faculty consultants, the student may participate in: (1) daily out-patient clinic conferences and ward rounds for review of cases and consultation services; (2) weekly infectious disease/chest and immunology clinics for evaluation and disposition of ambulatory patients; (3) clinical microbiology laboratory; (4) weekly chest, infectious disease and radiology conferences; and (5) limited research projects by special arrangement. The schedule enables insight into practical diagnosis and therapy, correlation of laboratory and clinical data, and the theoretical basis of patient management. Clyde, Collier, Denny, Fernald, Henderson, Ingram.

407. DEVELOPMENTAL DISABILITIES (6). This elective, centering in the Division for Disorders of Development and Learning, focuses on both normal and abnormal child development. The student is an active member of an interdisciplinary team. In addition to training in the neuropediatric assessment of development, including differential diagnosis and biomedical management, he or she observes parallel methods of assessment and of therapy in psychology, speech and hearing, physical therapy, occupational therapy, nutrition, pedodontics, special education, nursing and social work. Beyond this each student's program may be specifically tailored, but generally includes

exposure to a wide range of specialized evaluation and therapeutic programs in both the Child Development Institute and the community, to methods of interview and interpretation with parents, and to assessment of family environment and community resources. Periods 1, 4-12. Chamberlin, Teplin, Sugioka, and others.

408. PEDIATRIC HEMATOLOGY AND ONCOLOGY (6). Exposure is provided to the theories and practices of clinical hematology and oncology, with particular emphasis on pediatric problems. The diagnosis and management of both inpatients and outpatients will be studied. Conferences will be held regularly to discuss general and specific topics. This elective allows the development of special skills which are applicable to all areas of medicine, and at the same time allows insight into the specific problems of childhood cancer and hematologic disorders. Wells, Whisnant, Williams, and McMillan.

409. AMBULATORY PEDIATRICS (6). This elective introduces the student to a spectrum of ambulatory pediatric problems. The student will evaluate children in the various pediatric outpatient clinics, and there will be assigned rotations with community agencies that serve children. Emphasis is placed on the comprehensive evaluation of children, including medical, developmental and psychosocial areas. Each weekday morning at 8:00 A.M. in the London Library, there is a one hour conference for case discussions and the presentation of pertinent topics in ambulatory pediatrics. Office laboratory skills are also covered. Hamrick and staff.

410. PEDIATRIC NEUROLOGY (6). A broad-based introductory course to the major clinical problems encountered in childhood neurology is offered. There are two types of outpatient experience. The first involves the general Pediatric Neurology Clinic where there will be exposure to the problems of developmental disorders, learning disabilities, seizure disorders, headaches, and other primary neurological diseases in children. In the Pediatric Epilepsy Clinic an optional additional experience can be obtained for those wishing to work more closely with pharmacological and other aspects of seizure management. The student will be expected to participate actively in the weekly Pediatric Neurology Professor Rounds and in the biweekly didactic Pediatric Neurology Grand Rounds. Greenwood and Pediatric Neurology Staff.

411. NEONATOLOGY; WAKE MEMORIAL HOSPITAL (6). The course is intended to provide supervised clinical and didactic experience in neonatology in a Level II Community Hospital to fourth year medical students. It will include weekend and night coverage of intermediate care, but the majority of time will be intensive care. The on-call schedule will be similar to that of the pediatric intern, but the experience will differ in the following ways: (1) The student will be asked to present a topic of his choice in neonatology or to discuss in detail at one of the teaching conferences. (2) The student will be expected to present his patients at rounds. (3) The patient load will be limited. (4) Tutorial sessions will be provided weekly by the neonatologist, and as needed by the resident assigned to the nursery. (5) An evaluation of the student and the clerkship will be discussed with the student at the end of the rotation. *Periods 1, 3, 5, 7, 8, 10.* Thullen, Vaughn.

412. ENDOCRINOLOGY (6). Extensive clincial experience is provided with patients with documented endocrine disorders in the Endocrine and Diabetes Clinic in the Department of Medicine and in the Pediatrics Endocrine Clinic. Specific activities include consulting rounds on the hospital wards and the clinical research unit, work-up of clinic patients, and conferences with the attending staff. French, Van Wyk, Underwood, Ontjes, Gray, Earp, Gwyne, D'Ercole, Clemmons, Utiger.

413. NEPHROLOGY (6). This elective, given in conjunction with Medicine, seeks to provide a rational approach to the pediatric patient with abnormalities in renal function or in acid-base or salt and water balance. Supervised self instruction, supplemented by weekly tutorials, review of major clinical conditions (acute glomerulone-

phritis, acute renal failure, nephrotic syndrome, fluid and electrolyte and acid-base disorders). Commonly encountered problems (urinary tract infection, isolated hermaturia and/or proteinuria, hypertension) and the interpretation of essential diagnostic studies (evaluation of the urinary sediment, calculation of creatinine clearance and protein and electrolyte excretion, radiographic studies and renal morphology) are reviewed in the context of clinical experience with patients from the outpatient service. Three or four patients will be seen in the weekly outpatient nephrology clinic and inpatients may be seen at the discretion of the student. Morris, Conley.

414. ACTING INTERNSHIP IN NEONATOLOGY AT NCMH (6). The course is intended to provide supervised clinical experience in neonatology, with tutorial support, to fourth-year medical students. The patient load will be individualized, additional technical and theoretical assistance will be provided by the Junior Assistant Resident as required, and a selected bibliography and tutorial sessions will be provided as needed. Kraybill and staff.

416. ACTING INTERNSHIP IN COMMUNITY PEDIATRICS (6). During the four week elective the student lives in the community and works with physicians on alternate nights and weekends in the emergency room of Edgecombe General Hospital, a 125-bed county-owned modern hospital, and during the day in the group practice facility in the Tarboro Clinic, an 18-physician multispecialty group practice located adjacent to Edgecombe General Hospital. The student is responsible for the admitting history and physical evaluation on those patients who require admission, and is responsible for them during hospitalization. The student will attend daily teaching rounds given by members of the Tarboro Clinic staff and will spend brief periods of time in a solo practitioner's office, the local mental health facility, the Edgecombe County Health Department and Edgecombe County Social Services Office, as well as civic club meetings and a session of Edgecombe-Nash Medical Society. The student is encouraged to view community problems as a whole and to formulate an approach toward improving a particular community situation. Cutchin, Hemingway, Franklin, Newton.

419. COMMUNITY NEONATOLOGY — PERINATOLOGY at New Hanover Memorial Hospital. (6). This course will provide an individualized supervised clinical experience in neonatology-perinatology selected by the staff neonatologist and neonatal panel of community pediatricians in New Hanover Memorial Hospital with residency programs in obstetrics, internal medicine and surgery (none in pediatrics). Development of high risk clinics, maternal intensive care, regional transport and cooperation, and of pediatric services will be assessed, and appropriate community roles identified. *Period 4.* Wong.

420. DIABETES CAMP (3). The student, serving on a medical staff of 25, will participate as a cabin clinician responsible for the care of 8-12 children with diabetes. Clinicians live in the cabin with campers and, with assistance of counselors, assist in testing urine and blood glucose, supervising insulin injections and eat with campers. The student will participate in camp activities and be available to treat hypoglycemic reactions that may occur. Clinicians rotate infirmary duty under the guidance of a consulting physician. Students present afternoon medical seminars on subjects related to diabetes; students are expected to read a suggested reference list. After evening activities, the clinician meets with the medical team (clinician, nurse, dietitian and physician) to review urine records and decide on the dose of insulin to be suggested to each camper the next day. At the conclusion of camp, the clinician meets individually with parents to review the progress of his or her camper and outline the recommendations for home diabetes management. Strickland, Ellis, Delcher, Huff, Hammonds.

AHEC 421. ACTING INTERNSHIP AT MOSES CONE.

AHEC 422. ACTING INTERNSHIP AT CHARLOTTE.

AHEC 423. ACTING INTERNSHIP AT WAKE.

429. (MEDI 429). SEMINAR IN INFECTIOUS DISEASES (0). A non-credit lecture and discussion course on practice problems of infectious disease diagnosis and management. Primary emphasis will be given to those illnesses commonly encountered in routine clinical practice. Pharmacology and physiology will be included as needed to formulate rational therapeutic plans. Algorithms will be developed for several clinical problems. This course will supplement but not replace the clinical electives MEDI 411 and PEDS 405. Sparling, Clyde, Fischer.

AHEC 443. MEDICAL GENETICS (6). The student will participate in genetic consultations on the wards and in the clinics and in the evaluation and counseling of patients (approximately 500 yearly) seen in the genetic counseling clinics. Supervised participation is also possible in the counseling and diagnosis of patients having antenatal diagnosis (approximately 300 yearly). Each student may work with patients on either the internal medicine or pediatric services, or both. The student may choose to make field trips to study a family with a genetic disorder, to learn cytogenic techniques, to read selected topics in medical genetics under supervision, or by special permission, to undertake a research project. Aylsworth, Kirkman, Swift and staff.

## THE DEPARTMENT OF PHARMACOLOGY

206. PHARMACOLOGY OF HORMONES AND VITAMINS AFFECTING MINERAL HOMEOSTASIS AND BONE METABOLISM (2). See page 184 for complete description.

211, 212. INTRODUCTION TO PHARMACOLOGICAL RESEARCH (4 each). See page 185 for complete description.

301. RESEARCH IN PHARMACOLOGY (var.) See page 185 for complete description.

330. SEMINAR: RECENT ADVANCES IN PHARMACOLOGY (1). See page 186 for complete description.

331. SEMINAR: GENERAL PHARMACOLOGY (1). See page 186 for complete description.

## THE DEPARTMENT OF PHYSIOLOGY

401. PHYSIOLOGY MECHANISMS ASSOCIATED WITH PAIN (6). Prerequisite: completion of first year of medical school. Physiological and pathological mechanisms related to pain are taken up in a combined experimental and discussion format. Considerable flexibility in the details is possible. Participants will be given the choice of becoming associated with an on-going research project utilizing experimental animals and man or collecting material available from patients on the wards. The actual handling of data would be combined with directed reading. Students participating for longer periods may anticipate gathering sufficient material for credible student research reports. Possible topics include the relations between stimuli, pain, other sensation, and alterations in pain sensibility in patients with organic diseases. Perl, Light.

404. NEUROCHEMISTRY OF SPINAL MOTONEURONS (12). Prerequisite: admission to medical school. The student will participate in ongoing research on isolated spinal motoneurons. The research is directed toward normal, regenerating and degenerating neurons and deals with the chemical changes underlying the abnormal states. Training will be offered in a number of techniques, including cell fractionation, electrophoresis of proteins, enzymatic and other quantitative assays of soluble and membrane-bound neuronal constituents. McIlwain.

405. CARDIOVASCULAR CONTROL MECHANISM (6). Prerequisite: completion of first year of medical school. The course will be adjusted to each student's needs or interests. The topics covered may include nervous, chemical, thermal or mechanical systems which are involved in the control of the cardiovascular system. Depending on the student's desire, the course material may be designed to study certain clinical conditions such as shock, disseminated intravascular coagulation, myocardial infarction, hypertensions, congestive heart failure or others. Yonce.

407. SPECIAL TOPICS IN BIOMEDICAL ENGINEERING (3). Prerequisite: calculus. Individual instruction in applications of biomedical computing or medical electronics to biomedical problems. Coulter.

410. RESEARCH ON MEMBRANE STRUCTURE AND FUNCTION (6). Prerequisite: completion of first year of medical school. The primary objective of the elective is to introduce the student to current biomedical techniques used to study the structure and function of membranes. In particular, the student will participate in studies concerned with the sarcoplasmic reticulum membrane of skeletal muscle. These include (1) isolation of sarcoplasmic reticulum by sucrose gradient centrifugation, (2) characterization of this cell organelle and derived membrane fractions by thin layer chromatography, polyacrylamide gel electrophoresis and by a variety of biomedical assays, (3) purification

of the membrane components and (4) reconstitution of a functional membrane from the purified sarcoplasmic reticulum proteins and lipids. Meissner.

GRADUATE SEMESTER COURSES available to medical students. See course numbers: 301, 302, 303.

## THE DEPARTMENT OF PSYCHIATRY

401. OUTPATIENT PSYCHIATRY (6). Prerequisite: third-year psychiatry clerkship. A variety of clinical experiences (screening interviews, diagnostic conferences, psychotherapy, etc.) under individual and group supervision are offered. Students work in a team with residents in the Walk-in Clinic. Patient simulation and audiovisual materials are available to enhance learning by students. Students are encouraged to pursue particular interests, supervised readings, student health, community psychiatry, etc. Spencer, Fidler, Ewing, Smith; staff.

403. CHILD PSYCHIATRY (6). Prerequisite: admission to medical school. About half the time is spent in closely-supervised outpatient child and family diagnostic work, where students learn interview and play-therapy techniques and participate in the psychiatric and psychological evaluation of children, adolescents and families. Additional experiences include a weekly child psychiatry treatment-psychotherapy review conference, selected readings and tutorial sessions with the faculty and selected work on the local child psychiatry inpatient unit, including the following of one child inpatient. This rotation is particualrly germane to students planning careers in pediatrics or family medicine. Students with special interests may work at individualized rotations with the child psychiatry faculty. All students are strongly urged to talk personally with Dr. Lineberger a month before starting the rotation. Lineberger. Tucker, Schmitt, Gualtieri, staff.

404. CONSULTATION PSYCHIATRY (6). Prerequisite: third year clerkship; selection is made by interview. Under the supervision of a faculty member the student will respond to selected psychiatric consultations requested by medical, surgical and gynecologic services. There will be ample opportunity to observe the interaction of psychosocial factors in illness, and a limited chance to engage in psychiatric intervention, drug treatment, crisis management and short term psychodynamic psychotherapy. Additional experiences may be arranged by consultation with the course faculty. Faculty: Raft, Drossman, Haggerty, Jensen, McCartney, McKee, Sibrack, Swift.

406. CLINCIAL AND RESEARCH ASPECTS OF ALCOHOL AND DRUG USE AND ABUSE (6). No prerequisites. Students spend one third to one half of their time involved in clinical and research studies in alcoholism and sedative drug abuse. They meet private and staff patients with Dr. Ewing on the outpatient and inpatient services. By special arrangement, they can work up patients who attend the special weekly alcoholism clinics. They study patients in the general hospital who have a primary diagnosis of alcoholism and/or sedative drug abuse. Students visit the alcoholic rehabilitation center and similar treatment facilities in the area. They are exposed to ongoing research approaches including pharmacological, animal studies, psychophysiology and epidemiology. Students seeking a longer assignment to this elective will have the opportunity to work in some of these research studies. Finally, the student will be guided to a special reading program for which adequate time is made available. Ewing; staff.

410. PSYCHOPHYSIOLOGICAL RESEARCH (6). Prerequisite: first year of medical school. A variety of research topics are available for either investigative efforts or as a library project. The primary theme will concern the effects of stress on cardiovascular activity and the relationship to pathological states. Of particular interest is essential hypertension. The research can either involve drugs, normal humans or humans with a labile blood pressure. This elective can be offered as part time over a semester

and can involve any combination of time devoted to laboratory or library work. Obrist.

417. STUDENT MENTAL HEALTH (var.). Prerequisite: psychiatry clerkship. An eight week elective providing a closely supervised opportunity to work with college students on an outpatient and limited inpatient basis. Emphasis will be on understanding the patients' concerns in the context of the normative processes of adolescent/young adult development. Specific focus will be on the diagnosis interview and brief goal-directed psychotherapy and/or crisis intervention. Liptzin; staff.

418. FORENSIC PSYCHIATRY, DOROTHEA DIX HOSPITAL (6). The elective in forensic psychiatry allows the fourth year student the opportunity to explore the challenging and often controversial interface between psychiatry and the criminal justice system. Students will work with a forensic psychiatrist doing pre-trial evaluations, reporting on competency to stand trial and criminal responsibility. Short-term inpatient psychiatric treatment is also an intimate part of the pre-trial evaluation process. The student will also go to court and observe testimony of the psychiatric expert witness. Rollins, Berg.

419. COMPREHENSIVE CARE OF THE ALCOHOLIC PATIENT (6). Wake County ATC is a licensed psychiatric hospital specializing in alcoholism treatment. The center has five services: 24 hour, 7 day per week crisis evaluation; 8 bed medical detox ward; 20 bed intensive treatment ward; outpatient unit; and family treatment service. The student's patient care responsibilities begin with patients chosen from the detox ward who are expected to complete their hospitalization. The student will design and provide under direct supervision "a comprehensive recovery program for the patient with particular attention to the multidisciplinary cooperation necessary to provide comprehensive care."

More elaborate descriptions of goals, a reading list, orientation to the ATC library and audiovisual materials will be made available at the start of the rotation. The experience is designed to appeal to the future primary care physician. Bridges.

420. CLINICAL RESEARCH UNIT, DOROTHEA DIX HOSPITAL (6). Prerequisite: completion of psychiatry clerkship. The Clinical Research Unit is a 20 bed unit consisting of patient dayroom and dormitory space, clinical and administrative offices and statistical, clinical and physiological laboratories. The major area of research interest is in biological psychiatric research with special interest in the influence of endocrine substances in the etiology, pathogenesis and treatment of affective disorders, schizophrenia, and alcoholism; the evaluation of new antidepressant and phenothiazine medications in regard to therapeutic efficacy and toxicity. Opportunities for learning experience; scientific method in clinical research, standardization of behavioral and physiological evaluations; orientation toward the physiological interpretation of behavioral disorders; opportunity to conduct a specific research project. Garbutt; staff.

424. CHILD PSYCHIATRY AND DEVELOPMENT DISORDERS (6). Prerequisite: first year of medical school. Students will work with Dr. Gualtieri with hyperactive and autistic children in the Pediatric Psychopharmacology Clinic at the DDDL. They will visit regional centers for the mentally retarded on consultation visits with Dr. Gualtieri. They will work directly with behaviorally and emotionally disturbed children on the Children's Inpatient Psychiatry Service on 5 South (NCMH), and they will visit local classrooms for autistic children with Dr. Marcus of Piedmont TEACCH. The goal is to introduce medical students to the broad range of children with psychiatric and developmental handicaps, with emphasis on differential diagnosis, medical approaches, and proper treatment. Students will have direct patient responsibility on the Inpatient Unit; in other areas they will work directly with Dr. Gualtieri or Dr. Marcus. Gualtieri, VanBourgondien, Marcus.

## THE DEPARTMENT OF RADIOLOGY

MEDICAL RADIOLOGY. Radiology rounds are conducted with the Department of Medicine. The teaching conference is directed chiefly toward differential diagnosis, discussions of treatment, the selection of further diagnostic procedures and patient management. *Three hours daily.* Scatliff and staff.

401. GENERAL RADIOLOGY (6). The student will spend full time in the department with the attending and resident staff in various activities, including film interpretation, fluoroscopic procedures, angiographic studies, and conferences. Rotation through the radiotherapy division and nuclear medicine laboratory will also be possible. Scatliff and staff.

402. EXTRAMURAL PRECEPTORSHIPS (6). Preceptorships in radiology departments of affiliated hospitals for one month can be arranged through the chairman of the department of radiology of the medical school. Jones and staff (Durham), Fisher and staff (Cone), Lackey and staff (Charlotte).

403. PEDIATRIC RADIOLOGY (6). Prerequisite: completion of General Radiology Elective. Conferences will be held and practical work carried out in diagnostic roentgenology as applied to pediatric problems. Scatliff and Gaisie.

404. NEURORADIOLOGY (6). Prerequisite: completion of General Radiology Elective. Conferences will be held and practical work in diagnostic roentgenology as applied to neurological and neurosurgical diseases will be carried out. Whaley and staff.

407. CARDIOPULMONARY RADIOLOGY (6). Prerequisite: completion of General Radiology Elective. The combined staffs of adult and pediatric cardiology, thoracic surgery, pulmonary medicine and radiology participate in problem case study, discussion and treatment planning. Particular emphasis is given to the selection of patients for corrective surgical procedures. The evaluation of radiological studies of cardiac, vascular and pulmonary abnormalities is carried out by means of conferences, teaching file seminars, and participation during daily film reading sessions. Delany.

408. IMAGING (6). Prerequisite: completion of General Radiology Elective. Basic techniques, including nuclear medicine and computed tomography, are demonstrated. Daily conference in which integration of results between the newer modalities and conventional radiology are correlated. Consultation with referring physicians on proper choice of technique to answer clinical questions. Ample supply of teaching aids. McCartney and staff.

411. FUNDAMENTALS OF INVESTIGATIVE RADIOLOGY (var.). Prerequisite: completion of one year of medical school. Under close supervison of a faculty advisor, the student will be encouraged to initiate and complete a limited research project within the broad field of diagnostic radiologic investigation. Although clinical radiologic research projects will be permitted in special circumstances, the student's elective experience should emphasize the application of investigative radiologic techniques to the study of animal models of human disease. Microangiography and other microradiographic studies of excised organs and *in vivo* angiography or other radiologic procedures in laboratory animals will be encouraged. Radiologic-pathologic correlation will be emphasized. Appropriate technical assistance will be provided on a part-time basis.

Limited opportunities also exist for the student with an interest in radiologic physics to pursue projects in the fields of digital imaging and computer applications in radiology. Clark, Cuttino, Scatliff, Kwock, DiBianca.

412. BONE & JOINT RADIOLOGY (6). Prerequisite: completion of General Radiology Elective. This elective is designed to give special emphasis to clinical problems in the diagnosis of bone and joint pathology. The student will participate fully in the dai-

ly work of the bone & joint radiology section, including film interpretation, consultation, and conference activities. This elective is offered to give added knowledge to those students anticipating a career in specialties dealing with bone and joint disease. Guilford and staff.

413. RADIOLOGICAL DIAGNOSIS AND PROCEDURES (6). Prerequisite: completion of General Radiology Elective. This elective is designed for the student considering Diagnostic Radiology as a specialty. The four week course is intended to provide indepth practical experience in radiological diagnostic problem solving. The student will participate in studies when possible under resident and attending supervision. One week in each of the following is suggested: GU radiology — intravenous pyelography; Gastrointestinal studies — fluoroscopy; Special procedures — vascular and biopsy techniques; one week flexible. Mandell and general diagnostic division staff.

414. RADIATION ONCOLOGY (6). A four-week elective course is offered in radiation oncology to students who have successfully completed two years of medical school. Under the supervision of a preceptor, the student actively participates in the evaluation of patients referred to the division for consultation. The student has the opportunity to perform physical examinations on a large number of patients with a wide variety of physical findings. The student also has the opportunity to correlate his findings with the radiological studies whenever applicable. In addition to the new patients, a large number of patients are seen each month in the department in follow up who have been treated in the past. The student is expected to attend the multidisciplinary conferences and clinics in which some of the patients are seen. The student becomes acquainted with the techniques of radiation therapy, the use of intracavitary and interstitial isotopes, and the use of computers for treatment planning. Varia and staff.

415. INTRODUCTION TO MEDICINE THROUGH IMAGING (6). Prerequisite: completion of first year of medical school. Course provides an introduction to imaging procedures, including ultrasound, CT, nuclear medicine and radiography. A feeling for consultative medicine will be gained and particular attention will be paid to the timing and sequencing of orders for a procedure(s). The student is taught the value of the procedure alone and of complementary procedures, and particularly the importance of a good and complete clinical history is emphasized. Imaging division staff.

## THE DEPARTMENT OF SOCIAL AND ADMINISTRATIVE MEDICINE

403. READINGS AND PROJECTS IN COMMUNITY MEDICINE (6). This elective allows a student to pursue studies of individual interest in some aspect of community medicine by working closely with a member of the University faculty who is interested in the same field of study. Working individually or in a small group (occasionally with students from other disciplines), the medical student has the opportunity to arrange for elective study in any area so long as it broadly relates medicine to society. For example, activities may range from research and developmental activities in health care delivery programs, to seminars in religion and medicine, to participation in the development of a new health legislation, etc. Depending on the specific project and the availability of a faculty preceptor, this elective can be conducted during a four-week elective period or can run concurrently with the second year curriculum. Coordinator: Mayer.

404. MEDICINE AND THE LAW (1). This elective seminar will alert students to laws affecting medical practice. Upon successful completion of the course, the student should be able to: describe the federal and state legal system, understand the laws governing abortions and sterilizations, know the duties a physician has to the dead and dying, know when an autopsy can be legally performed and when a transplant is legally permissible, decribe the legal constraints of treating the mentally handicapped, know the conditions under which medical information can be shared, be able to provide adequate medical record documentation, be aware of the laws governing malpractice and

consent to treatment and understand the relationship between the physician, the hospital medical staff, and the hospital governing board. *Fall semester.* Solberg.

405. MEDICAL CARE RESEARCH (var.). Opportunities for participation in medical care research are available under the sponsorship of the Health Services Research Center and, in some instances, project directors in various schools of the Division of Health Affairs. Ongoing projects include new medical manpower experiments, services to rural areas without physicians, attempts to improve effectiveness of group practice, evaluation of the contents of practices of various types of physicians, studies of patients' attitudes, studies of community health planning, etc. Opportunities will be provided when possible for students to investigate problems of special interest even when not connected with ongoing projects. All candidates must be approved by the coordinator for this elective and should report to HSRC, Chase Hall, Manning Drive, on the first day. This course is designed to run concurrently with the second-year curriculum. DeFriese.

406. READINGS IN THE ECONOMICS AND POLITICS OF HEALTH CARE (3). This elective is designed as a tutorial for selected students with an interest in developing a background in health care. Readings, library work and regular conferences with faculty to review and discuss readings are required. Field work in the United States and other countries. *Fall and spring semesters.* Wilson.

407. READINGS IN MEDICAL ETHICS (6). This elective is designed to allow students with clinical experience an opportunity to explore ethical questions in some depth. Emphasis will be given to the fundamentals for analyzing and adjudicating moral conflicts involved in medical decisions. Working individually or in small groups, students will probe a specific area of interest, drawing upon their clinical experiences and a variety of theoretical approaches. Areas for study include abortion, euthanasia, paternalism in physician-patient relationships, informed consent and experimentation with human subjects, among others. Offered as a full-time four-week elective or as semester course. Churchill.

408. STUDIES IN THE MEDICAL CAREER (3). This elective is offered either as a seminar or as individual guided study. The purpose is to explore, through the study of physicians' lives, the meaning of the medical career. The goal of the seminar is for the student to attain an understanding of considerations that lead to selection of various career pathways in medicine, the sources of fulfillment and frustration in the physician's work, and points of view characteristic of physicians at various life and career stages. The elective draws from both the social sciences and the humanities. The data to be examined are diverse and may include written and oral biographies, manpower data on physician distribution and mobility, fictional prose and poetry, essays, and studies of medical education, the physician's work, adult development and career outcomes. Each student will work individually on a small, self-contained research project dealing with an aspect of the medical career and will write a formal essay describing the results and meaning of the research undertaken. Offered as full-time elective or as semester course. Madison.

409. PROJECTS IN EPIDEMIOLOGIC RESEARCH (var.). This elective concerns the application of basic principles of epidemiology to the design and conduct of studies concerning the description, explanation, prediction and control of disease and health problems in human populations. Students will either (a) design an epidemiological investigation by developing the research protocol and writing a grant application; (b) participate in epidemiologic research studies ongoing in the Division of Health Sciences; or (c) where possible, conduct an original epidemiologic research project of interest, under supervision. The project selected by the student should provide familiarity with some methods of epidemiologic design and analysis. A written presentation of the research study is required of all students. All students must be approved by the course teachers before enrollment. Offered as a full-time four-week elective or as semester course. Runyan and Patrick.

411. READINGS IN SOCIAL SCIENCES AND MEDICINE (4). This course is designed for students interested in the social sciences of anthropology and sociology. A reading and tutorial course in the main, students may choose to study an area or a master thinker in anthropology or sociology. Examples in sociology might be deviance, aging, social structure, social control, or ethnicity in relation to health and illness. Students selecting these areas would be expected to do reading and some fieldwork on the wards or in the community as well as attend tutorial/seminar sessions. Alternatively students might choose to study a master of social science thought such as Malinowski, Levi-Strauss, Durkheim, Weber or Marx. Extensive reading would be expected of these students in preparation for tutorial sessions. A major written paper is required of all students. Offered in the spring and fall semesters. Estroff and Patrick.

## THE DEPARTMENT OF SURGERY

401. ACTING INTERNSHIP IN GENERAL SURGERY A (6). Prerequisite: completion of surgery clerkship. This elective provides the student with an experience comparable in many respects to that of a first year surgery resident. It is designed to complement the junior year surgery clerkship by offering increased responsibility in patient care and management of patients having both surgical and non-surgical diseases. Emphasis will be placed upon understanding basic mechanisms and pathophysiology of disease processes, clinical evaluation of patients with surgical problems and rationale for therapy. An opportunity will exist for some specialization in gastrointestinal diseases, neoplastic diseases, pediatric surgical diseases and surgery for endocrine diseases. Participation in the weekly outpatient clinic, clinical rounds, and conferences will be in conjunction with housestaff and attending physicians. The student may present selected cases in the preoperative conference and justify the diagnosis and recommendations for surgical therapy. This elective, which will provide valuable experience in pre- and postoperative management and in principles of surgical care, is recommended for the student considering postgraduate education in surgery. Croom; staff.

402. EMERGENCY AND OUTPATIENT SURGERY (6). Prerequisite: completion of surgery clerkship or permission of course director. This program will consist of experience in the Emergency Room and the Surgical Outpatient Department. During this time, the student will be responsible for attending the emergency room followup clinic at 8:30 each morning and seeing the scheduled and unscheduled admissions to the Surgical Outpatient Department, aiding in their evaluation and diagnostic studies. The student will also spend time in the Emergency Room seeing, in conjunction with the regularly assigned intern and resident, surgical emergencies and other emergencies where his or her presence might be required. During both phases of this period, the student will be under the direct supervision of the second year resident. A surgical attending is also usually present. In addition, there will be assigned reading of pertinent material dealing with the emergency and ambulatory care. Hansen.

403. ACTING INTERNSHIP IN VASCULAR SURGERY (6). Prerequisite: completion of all clinical clerkships. This elective is to acquaint the student with principles of management of surgical problems with an emphasis on vascular disease. He/she will have supervised responsibilities equivalent to that of an intern for a portion of the patients admitted to the service and will be an intimate part of the team caring for these patients. Teaching for the student will be at all levels: intern, assistant resident, resident, fellow and attendings. This elective should be an appropriate supplement for the third year clerkship in principles of surgical care. Emphasis will be on the basic mechanisms and pathophysiology of the disease, clinical appraisal of the disease and rationale of both surgical and non-surgical therapy. Postoperative management will stress fluid and electrolyte therapy and physiological monitoring of the patient. Johnson, staff.

405. ACTING INTERNSHIP IN GENERAL AND TRAUMATIC SURGERY (6). Prerequisite: completion of surgery clerkship. During one month period, the student

will be assigned duties of patient care similar to those of an intern. He/she will work with the intern during the days and will alternate nights and weekends taking first call. The student will be exposed to methods of management of general and traumatic surgical problems and at the completion of the rotation will be expected to write orders, change dressings, care for wounds, perform cut-downs and assist at surgery. Areas of reading will be suggested and the rotation will be conducted under the supervision of the chief resident and attendings on the service. Proctor and Mandel.

406. PRECEPTORSHIP IN SURGERY AND TRANSPLANTATION (6). Prerequisite: completion of surgery clerkship. The student will work under the individual supervision of Dr. Mandel. Depending on student desires and patient material available, in-depth instruction will be given in vascular surgery, trauma, general surgery and transplantation. Emphasis will be on an in-depth study of those problems in clinical surgery of interest to the student. Clinical material will be those patients on the vascular and trauma services. Mandel.

407. THE ACTIVE PRIVATE SURGICAL PRACTICE—ROCKY MOUNT (6). Prerequisite: completion of surgery clerkship. Students receive exposure to general, vascular and thoracic surgery in the setting of the mid-size North Carolina community. Care of the trauma patient requiring hyperalimentation and office practice are emphasized. Davis and Todd.

408. ACTING INTERNSHIP IN CENTRALIZED SURGICAL SERVICES — DOROTHEA DIX (6). Prerequisite: completion of all clinical clerkships. The student functions as a responsible member of the surgical team consisting of an intern, surgical assistant and a resident who are responsible for the immediate care of the patients on the surgical service. The student is given responsibilities within his or her competence. A wide variety of surgical experience is available for the surgical team varying from so-called "minor" surgery to more complex procedures. Supervision is by the housestaff, the director of the surgical service and the attending clinical staff. Schiebel; staff.

409. ACTING INTERNSHIP IN SURGERY — NEW HANOVER MEMORIAL HOSPITAL, WILMINGTON (6). Prerequisite: completion of surgery clerkship. This elective is designed to offer the student an opportunity to obtain instruction in management of general and allied specialty surgical patients from full-time practitioners in the community. He/she will be assigned to a private surgeon or the chief resident and will have the opportunity to examine all patients, record findings for review by the attendings and assist at operations. At appropriate times the student will participate in the private physician's office practice, the facilities being located adjacent to the hospital. In addition to daily rounds and operations with the team, the student will attend and participate in all conferences related to surgery. Mason; staff.

412. ACTING INTERNSHIP IN GENERAL, VASCULAR AND THORACIC SURGERY — GENERAL HOSPITAL OF VIRGINIA BEACH (6). Prerequisite: completion of all clinical clerkships and approval by Dr. Mandel. This is a four-week rotation at General Hospital of Virginia Beach, Virginia under the direct supervision of four board-certified general and thoracic surgeons. Extensive clinical experience in the operating room, hospital (private) and office of an academically-oriented surgical group practicing in a mid-size community hospital is offered. Clarke, staff.

413. ACTING INTERNSHIP IN GENERAL AND THORACIC SURGERY — DURHAM COUNTY GENERAL HOSPITAL (6). Prerequisite: completion of two years of medical school. This program offers the student an opportunity to serve as an acting intern in a teaching, community hospital, which provides a wide spectrum of surgery required by a large community, plus more sophisticated problems which are referred in from this area of the state. The community setting provides a patient population, approach to diagnosis and treatment and management of patients which differs somewhat from that seen in the medical center. The acting intern serves as a participating member of the surgical team working directly under the supervision of the Duke

resident and attending staff. The student has primary responsibilities for a specific group of surgical patients, both on an inpatient and outpatient basis, and actively participates in a busy schedule of conferences, teaching rounds and seminars. Familiarization with the literature concerning problems at hand is required and stressed. Davis; staff.

414. CLINICAL SURGERY — VETERANS HOSPITAL, FAYETTEVILLE (6). Prerequisite: completion of surgery clerkship. This elective offers the opportunity to obtain clinical experience in a broad range of surgical problems. The student will be associated with an attending surgeon and will become intimately involved in the care of his patient. Continuity of patient care is stressed by following the patient from the clinic, through pre-admission workup, admission studies, operative intervention and, when possible, post discharge clinic followup. During the period of the elective, association with several of the attending surgeons, in rotation, is encouraged. Basic surgical principles, including x-ray, laboratory and pathologic data, will be stressed through informal conferences and discussions. Students will be supervised in the performance of certain diagnostic and therapeutic procedures, will participate in formal conferences and will be assigned specific on-call responsibilities. With supervision, the student may assume an active part in the treatment of patients presenting with surgical emergencies. Smith; staff.

415. GENERAL SURGERY — CHARLOTTE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. Students will work as clinical clerks or externs under the direct supervision of house staff and attending staff, the latter including a full-time Director of Surgical Training. Work will consist of doing histories and physical examinations upon and of observing and assisting with preoperative and postoperative treatment of hospitalized patients, and also of acting as a second assistant during operations on those patients. Students will work in the clinics and, if desired, will be placed on a night call roster to assist house officers with nocturnal surgical activities. The practical experience thus gained will be complemented by regularly scheduled, formal conferences and lectures and by informal person-to-person instruction and discussion as the opportunities for the latter present themselves. Hamit, staff.

416. SURGICAL EXTERNSHIP — GASTONIA (6). Prerequisite: completion of two years of medical school. Gastonia Surgical Associates is a five man group performing general surgical procedures as well as vascular and thoracic procedures. In addition, two of the surgeons place permanent endocardial pacemakers. The hospital is an approximately 400 bed institution with a referral population of about 200,000. The large and varied practice involves approximately 80% elective cases and 20% emergent surgical problems. The student responsibilities would be, first, daily rounds with a preceptor and close involvement in both pre- and postoperative management. Second, consultations would be seen with a preceptor or independently as the situation evolved. Third, the student will admit all new patients and evaluate consultations prior to conferring with the preceptor. Fourth, the student will serve as assistant in all operative procedures on certain patients. Fifth, the student will assist the preceptor in patient follow-up and evaluation during office hours. Couture; staff.

417. GENERAL SURGERY IN BOONE (6). Drs. Lowell Furman and Richard Furman have an active private practice doing general, thoracic and vascular surgery. The student would scrub on surgical cases in the morning and assist with office practice in the evening, as well as be able to participate in evening rounds and emergency surgery on a selective basis. The student would benefit not only from the surgical experience, but also in seeing the ins and outs of private surgical practice. He/she would also be exposed to the study and discussion and slide presentations of surgery in Third World countries due to the activity of the Drs. Furman traveling with World Medical Missions to foreign mission hospitals.

420. ACTING INTERNSHIP IN CARDIOTHORACIC SURGERY (6). Prerequisite: completion of surgery clerkship. The objectives of this course are: (1) to enable the

student to identify those clinical parameters critical in caring for the acutely ill patient and (2) to insure that the student can respond to the needs of such a patient in the appropriate clinical setting. During the rotation, the acting intern will work as an integral part of the house staff assuming responsibility comensurate with demonstrated ability. The student will be assigned patients for preoperative evaluation, operative experience and postoperative care. He/she will function as a responsible junior house officer for these patients so that the attending staff may judge ability to identify and solve problems in the ward, operating room and intensive care area. Wilcox; staff.

421. RESEARCH ELECTIVE IN CARDIOTHORACIC SURGERY (12): Prerequisite: admission to medical school. The objectives of this research elective are: (1) to acquaint the student with the management and use of physiological and hemodynamic parameters utilized in the assessment, diagnosis and prognosis of cardiothoracic disease and (2) to teach the student modern mathematical and bioengineering methods to analyze the information obtained using on-line computers. This research period will provide "hands on" experience in instrumenting animals and measuring physiological responses to different stimuli. Wilcox; staff.

430. ACTING INTERNSHIP IN NEUROSURGERY (6). Prerequisite: completion of surgery clerkship. The student will work up staff and private patients admitted to Neurosurgery, this consisting of the classical history and physical examination with particular emphasis on the neurological history and examination. He/she will participate in the work and teaching rounds carried out by the division and will attend the outpatient clinic. The student will observe and assist at neurosurgical and neuroradiological procedures. He/she will also attend the following conferences scheduled within the division: Neurosurgery Grand Rounds, Neuroanatomy-Neurophysiology Seminar, Gross Neuropathology Conference, Surgical (Histological) Neuropathology Conference and Neuroradiology Conference. Mahaley; staff.

432. PRECEPTORSHIP IN NEUROSURGERY — DURHAM (6). Prerequisite: completion of all clinical clerkships. The student will be associated on a one-to-one basis with the attending neurosurgeon and will work up all interesting patients and follow through complete workup, preoperative care, operation and postoperative care. The main emphasis will be on good neurologic history and physical examination with differential diagnosis. There will be some work in EMG and neuroconduction studies if desired. Weekly grand rounds with adult neurologists, pediatric neurologists and other neurosurgeons will be attended as well as available neurology and neurosurgery conferences at UNC and Duke. Price, Kihlstrom.

433. RESEARCH IN NEUROLOGICAL SURGERY (6). Prerequisite: completion of two years of medical school. The student will be permitted to select one of the ongoing neurosurgical research laboratory activities and to participate actively in any one of these several areas of ongoing research: Tissue culturing of brain tumors, immunological evaluations of brain tumor patients, hybridization techniques and monoclonal antibody studies and experimental regional brain ischemia. Mahaley; staff.

440. ACTING INTERNSHIP IN ORTHOPAEDIC SURGERY (6). Prerequisite: completion of surgery clerkship. This program is offered to provide experience in the management of musculoskeletal problems similar to those that may be encountered during internship. During this time, the student will perform in essentially the same capacity as the intern on the orthopaedic service. Instruction will be provided in: (1) examination, diagnosis and treatment of musculoskeletal disorders; (2) casting, splinting and traction techniques; (3) emergency care of major and minor injuries of the musculoskeletal system; (4) operating room techniques and procedures in orthopaedics; (5) pre- and postoperative patient care. Wilson; staff.

441. ACTING INTERNSHIP IN ORTHOPAEDIC SURGERY — WAKE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. The acting intern shares the learning opportunities and responsibilities with the orthopaedic resident

staff. Depending on the objectives of the student and his/her experience and talent, the amount of time in the emergency room, outpatient clinics, private physicians' offices, operating room and library varies. All will do some of each. The student will observe and participate responsibly in the care of outpatients and inpatients. Efforts are made to have the student work in areas which best fit his/her educational interests and needs. Flexibility exists in this rotation for such. Dameron; staff.

442. PRECEPTORSHIP IN ORTHOPAEDIC SURGERY (6). Prerequisite: completion of two years of medical school and some familiarity with surgical environment. Students are associated on a one-to-one basis with an attending orthopaedic surgeon and will participate in teaching and patient care activities of the preceptor. When desirable, he/she may also take part in the research activities of the preceptor. Specifically, the student works up hospital admissions of the attending and presents them to the attending for evaluation and further discussion. The student will then follow these patients in the operating room where he/she will have the opportunity to correlate preoperative findings with operative pathology. Follow-up and management of postoperative cases will be provided by making hospital rounds and attending outpatient clinics with the attending surgeon. In addition, the student attends all of the orthopaedic conferences and seminars. Opportunity and direction will be provided for the study of musculoskeletal conditions. Night or weekend work will consist of being on call when the attending is on call for emergencies. Wilson; staff.

444. PRECEPTORSHIP IN ORTHOPAEDIC RESEARCH (12). Prerequisite: admission to medical school. Students are associated with one of the faculty members in the Orthopaedic Research Laboratories. Specifically, the student will participate in or undertake a research project pertaining to the physiology, biochemistry or ultrastructure of bone. At the start of the period, the student will work closely with a faculty member and/or their research staff but will, as rapidly as possible, branch off into an independent research project. Time is provided for library study and attendance at seminars relating to research. Wilson, Talmage; staff.

445. PEDIATRIC ORTHOPAEDIC SURGERY (6). Prerequisite: completion of all clinical clerkships. This elective is designed primarily for the student planning a career in Pediatrics, Orthopaedics or Family Practice. The student will attend weekly clinics in birth defects, hemophilia, children's foot disorders and scoliosis. In addition, the student will have the opportunity to work up and follow pediatric inpatients on the orthopaedic service. The student also may visit State crippled children's clinics during the month and attend all teaching activities relating to children's orthopaedics. Reading will be encouraged and library time provided. Wilson; staff.

446. SPORTS MEDICINE (6). Prerequisite: completion of all surgery clerkships. This program offers experience in the management of injury and illness related to the student athlete. Examination, diagnosis and treatment of trauma to students injured in varsity, junior varsity, club, intramural and physical education teams are stressed. Opportunity for patient care and observation of the treatment of a variety of injuries are offered. Wilson, Taft, DeWalt; staff.

450. ACTING INTERNSHIP IN OTOLARYNGOLOGY (6). Prerequisite: completion of all clinical clerkships and permission of the instructor. The selected trainee serves as a regular member of the housestaff over a four-week period. His/her responsibilities include personal instruction in reviewing the special techniques required for physical examinations, observations of attending staff in their management of patients and assuming care of patients, with access for consultation. Seminars are attended; opportunity for anatomical dissection afforded. The trainee assists at surgery and endoscopy and then, in turn, is assisted in the carrying out of minor surgical operations. There is opportunity to participate in on-going research. Students are encouraged to spend time in the outpatient clinic. Pillsbury; staff.

452. RESEARCH EXPERIENCE IN PHYSIOLOGIC ACOUSTICS (Var.). Prerequisite: completion of one year of medical school. Bench research in neurophysiology of hearing. Prazma and Thomas.

460. PRINCIPLES OF RECONSTRUCTIVE SURGERY (6). Prerequisite: completion of two years of medical school. This course will provide a broad exposure to all of the elements of plastic and reconstructive surgery. The student will be assigned directly to the attending surgeon and will participate in the examination, evaluation and treatment of patients in the operating room, the Hand Rehabilitation Center, the Burn Unit, the general plastic surgery clinic and the Cleft Palate and Speech Rehabilitation Program. Attending rounds, conferences within the division and additional seminar time will be provided throughout the elective period on the service. Bevin; staff.

461. REHABILITATION OF THE HAND (6). Prerequisite: completion of two years of medical school. This course is designed to provide intensive concentration on hand conditions from the time of their occurrence through their operative and therapeutic course, including long-term follow-up in the Hand Rehabilitation Center. Students will be assigned with the attending surgeon to all hand cases admitted to the Plastic Surgery service and will follow them throughout their course through the entire elective period. The student will attend and participate in the Hand Rehabilitation Center rounds and conferences and will be provided with an extensive bibliography for independent study regarding hand problems. Opportunities for attending hand conferences at other centers will be provided on a limited basis. Bevin; staff.

462. THE BURNED PATIENT (6). Prerequisite: completion of two years of medical school. In this elective, the student will be assigned to the Burn Unit at which time they will participate as a member of the clinical team involved with the total management of burned patients. Experience will be provided in the areas of physiological monitoring, the treatment of burns, bacteriology, drug therapy and physical therapy of the burned patient. Participation in the acute, operative and chronic management of burned patients will be intensive. Opportunity for participation in on-going clinical and laboratory research projects is available and is encouraged. Peterson; staff.

463. BURN TRAUMA SUB INTERNSHIP (6). Prerequisite: completion of surgery and medicine clerkships. The purpose of this elective is to provide the student with intensive experiences in the care of the thermally injured patient. The student will function as the intern, not as a consultant. Specifically, he/she will perform the initial work-up on the patient and be responsible for his daily care including surgery when feasible. Besides care of the acutely ill patient, the student will be responsible for patients returning for burn reconstruction in order to maintain continuity of care. Peterson; staff.

464. ORAL, FACIAL AND COMMUNICATIVE DISORDERS (6). Prerequisite: completion of all clinical clerkships. Clinical clerkship in the diagnostic evaluation and treatment of cleft lip, cleft palate and other oral, facial and craniofacial disorders and speech disorders in an interdisciplinary program involving plastic surgery, pediatrics (including genetic counseling), otolaryngology, audiology, psychology, social work, speech pathology, pedodontics, orthodontics, prosthodontics and oral surgery. This student will participate actively with all professional members of the program in the work-up and treatment of patients and in the laboratories and clinical facilities of the faculty. The student, through assigned readings, faculty conferences and clinical activity, will achieve a knowledge of craniofacial anatomy, physiology and pathology. Trier, Warren, Dalston, Strauss.

465. PLASTIC AND RECONSTRUCTIVE SURGERY (6). Intensive involvement for senior students in a busy plastic surgery practice (trauma, burns, hand, head and neck, congenital, esthetic, microsurgery). 50–80 cases per month. 100 clinic visits weekly. Student will gain much operating room experience as first assistant on most cases, plus active participation in emergency room. An excellent introduction to

private practice, with time divided between office and the 500 bed hospital. Krohn, Nicks.

470. ACTING INTERNSHIP IN UROLOGY (6). Prerequisite: completion of all clinical clerkships. The student assumes the responsibilities of an intern on the Urology service working under the close supervision of the resident and attending staff. In addition to pre- and postoperative care, there is ample opportunity to learn basic endoscopic techniques. Fried; staff.

471. BASIC CLINICAL UROLOGY (6). Prerequisite: completion of all clinical clerkships. Students will work under the close supervision of the attending and resident two days a week in the Urology Outpatient Clinic. In addition to the clinic work, the student evaluates all consultations directed to the Urology service. Each consultation is then closely reviewed with a member of the attending staff. Students perform a number of basic urological procedures including cystoscopy, prostatic needle biopsy and urethral dilation. Fried; staff.

473. SEMINAR: SPECIAL TOPICS IN UROLOGY (0). Prerequisite: consent of instructor. A weekly seminar in which a wide range of urological problems are discussed in depth. Students will participate with housestaff and appropriate references will be provided. Fried; staff.

474. RESEARCH IN UROLOGY (6). Prerequisite: consent of instructor. Students will be afforded the opportunity to carry out research projects under the close supervision of the Urology staff. Fried; staff.

475. ACTING INTERNSHIP IN UROLOGY — DANVILLE (6). Prerequisite: completion of all clinical clerkships. A unique experience which includes office as well as inpatient activities in a private urology practice setting with members of the Danville Urologic Clinic as well as residents in urology from the University of North Carolina. The medical student will be assigned to duties and responsibilities equivalent to that of a junior house officer. Landes; staff.

476. ACTING INTERNSHIP IN UROLOGY — WAKE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. The student assumes the responsibilities of an intern on the Urology service at Wake Memorial Hospital and works with the clinical Urology faculty at that institution. Parnell; staff.

BMME 231. TECHNOLOGY IN HEALTH CARE DELIVERY (Var.). Prerequisite: admission to medical school. This is a special tutorial course oriented toward particular topics in the application of technology to the delivery of health care. The student participates in an intensive, indepth study on the use of biomedical computation, medical electronics or mathematical modeling in a particular area which is jointly selected by the student and the faculty tutor. Coulter, Hsiao, Lucas.

AHEC 432. ACTING INTERNSHIP IN SURGERY — CHARLOTTE MEMORIAL HOSPITAL (6). Prerequisite: completion of all clinical clerkships. Students will work as clinical clerks or externs under the direct supervision of house staff and attending staff, the latter including a full-time Director of Surgical Training. Work will consist of doing histories and physical examinations upon and of observing and assisting with preoperative and postoperative treatment of hospitalized patients and also of acting as second assistant during operations upon these patients. They will also work in the clinics and, if desired, will be placed on a night call roster to assist house offices with nocturnal surgical activities. The practical experience thus gained will be complemented by regularly scheduled, formal conferences and lectures and by informal person-to-person instruction and discussion as the opportunities for the latter present themselves. Hamit; staff.

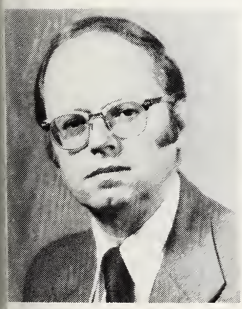
AHEC 434. ACTING INTERNSHIP IN SURGERY — NEW HANOVER MEMORIAL HOSPITAL, WILMINGTON (6). Prerequisite: completion of surgery clerkship. This elective is designed to offer the student an opportunity to obtain instruction in the management of general and allied specialty surgical patients from full-time practitioners in the community. He/she will be assigned to a team of two surgeons and will have the opportunity to examine all patients admitted by the team, record his findings for review by the attendings and assist at operations. At appropriate times, the student will participate in the private physicians' office practice, the facilities being located adjacent to the hospital. In addition to daily rounds and operations with the team, the student will attend and participate in all conferences related to surgery which include: Surgical Pathology conferences, Surgical Staff meetings and surgery conferences, on weekdays. Mason; staff.

## EXTRAMEDICAL COURSES

NUTR 110. APPLIED NUTRITION FOR HEALTH PROFESSIONALS (3). This course is designed for students interested in increasing their knowledge and understanding of the science of nutrition and in applying this knowledge to the preventive and therapeutic care of man in a health-team approach. The lectures will provide information on the nutrients, nutritional requirements in health and disease, and food as it relates to our society and human welfare. Clinical and community application of the information will be provided through laboratory activities and actual experience in hospitals and community health care agencies. The course includes 42 one-hour lectures and 7 additional hours in laboratory. (This course may also be taken as a tutorial during Fall or Summer with permission of the instructor). Anderson and staff.

PHYT 285. MOVEMENT DYSFUNCTION: ASSESSMENT AND INTERVENTION (var.). This course emphasizes the study of normal posture and movement in infancy and the consequences of brain injury. Acquaints students with both quantitative and qualitative assessments of movement and early identification of dysfunction. Contemporary philosophies of treatment and alternative strategies for promoting function and independence are explored through case studies, direct observation, experimental laboratory and seminars. Social-legal issues related to handicapping conditions are also addressed. Opportunities are provided for observation and interaction with therapists, educators, and families in a variety of community settings. Contact the instructor at least two months in advance to develop individual goals. Slaton.

# The Department of Anatomy



The Department of Anatomy teaches biostructure and cognate sciences to students of medicine, dentistry and other health-related professions and is committed to the generation of new knowledge through its research programs. Four first-year medical school courses are administered and taught by the department, Cell Biology, Embryology, Histology and Human Gross Anatomy. Other specialty areas of teaching and research include subcellular biology, molecular biophysics, neurobiology, reproductive biology, endocrinology, developmental biology, teratology, auditory biology, ultrastructure and cytochemistry. The Laboratories for Cell Biology are located in the department along with modern facilities for advanced electron microscopy, fluorescence microscopy, X-ray diffraction, computer-enhanced imaging, cell culture and hybridoma technology. These facilities serve collectively as a center for advanced high technology in biostructural analysis for cellular and subcellular research. The department also hosts a large academic program of seminars, colloquia and international conferences in biostructure. These biotechnical and academic programs are open to medical students as well as other advanced students on the campus.

## PROFESSORS

C. R. HACKENBROCK (Chair), Ph.D., Columbia University, 1966

D. W. HENSON, Jr., Ph.D., Yale University, 1964

M. C. JOHNSTON, Ph.D., University of Rochester, 1965

W. E. KOCH, Ph.D., Stanford University, 1962

E. K. MACRAE, Ph.D., Columbia University, 1946

W. S. POLLITZER, Ph.D., Columbia University, 1957

A. RUSTIONI, M.D., Parma University, Italy, 1965

W. E. STUMPF, M.D., Humboldt University, East Germany, 1952

## ASSOCIATE PROFESSORS

A. E. BLAUROCK, Ph.D., University of Michigan, 1967

C. W. CARTER, Jr., Ph.D., University of California at San Diego, 1972

K. A. JACOBSON, Ph.D., State University of New York at Buffalo, 1972

A. L. KIERSZENBAUM, M.D., University of Buenos Aires, Argentina; Ph.D., University of North Carolina at Chapel Hill, 1975

J. M. LAUDER, Ph.D., Purdue University, 1972

D. M. LAY, Ph.D., University of Chicago, 1968

J. J. LEMASTERS, M.D., Ph.D., Johns Hopkins University, 1975

R. L. MONTGOMERY, Ph.D., University of West Virginia, 1963

M. G. O'RAND, Ph.D., Temple University, 1972

R. PEACH, Ph.D., Manchester University, England, 1960

P. PETRUSZ, M.D., Medical University at Pecs, Hungary, 1963

T. W. SADLER, Ph.D., University of Virginia, 1975

## ASSISTANT PROFESSORS

K. W. T. BURRIDGE, Ph.D., Cambridge University, England, 1975

N. A. GRANGER, Ph.D., Case Western Reserve University, 1970

B. HERMAN, Ph.D., University of Connecticut, 1980

D. B. JENKINS, Ph.D., Milton S. Hershey Medical Center, 1975

H. E. MAYBERRY, Ph.D., University of Mississippi, 1964

K. K. SULIK, Ph.D., University of Tennessee at Memphis, 1976

## RESEARCH ASSOCIATE PROFESSORS

M. SAR, Ph.D., Michigan State University, 1968

L. L. TRES, M.D., Ph.D., University of Buenos Aires, Argentina, 1961, 1970

## RESEARCH ASSISTANT PROFESSOR

H. KREBS, Ph.D., McGill University, 1971

## ADJUNCT PROFESSOR

R. M. PRATT, Jr., Ph.D., Boston University, 1970

## ADJUNCT ASSISTANT PROFESSOR

L. KWOCK, Ph.D., University of California at Santa Barbara, 1974

## POSTDOCTORAL FELLOWS

P. Barbaresi; M. Beckerle; B. Chazotte; J. Crowell; G. Duncan; S. Fisher; H. G. Kapitza; P. Mangeat; L. Milam; J. Sedzik; C. Warner; R. Weinberg

## CURRICULUM

*Courses for Health Professionals other than Medical Students*

41. INTRODUCTION TO HUMAN ANATOMY (3). A general course primarily for persons preparing for careers as dental hygienists. *2 lectures and 2 laboratory hours a week. Fall.* Montgomery.

92. HISTOLOGY (2). Study of the microscopic anatomy of fundamental body tissues. For students of physical therapy. *2 lecture and 3 laboratory hours a week for 9 weeks. Fall.* MacRae.

93. NEUROANATOMY (3). Prerequisite: permission of instructor. An introductory study of the central nervous system. Lecture and laboratory. For students of physical therapy. *Spring.* Montgomery.

105fs. GROSS ANATOMY (5). Systematic approach to gross anatomy emphasizing a regional approach in the fall and stressing head and neck in the spring. Primarily for dental students. *Fall and spring.* Montgomery.

111fs. MICROSCOPIC ANATOMY (3). Lectures and laboratory classes provide an understanding of the microscopic anatomy and histology of the basic tissues and major organ systems of the human body. *Fall and spring.* Mayberry, Peach.

124s. BIOLOGICAL SCIENCE LABORATORY (4). Primarily for students of dentistry. *8 hours a week. Spring.* Staff.

191. GROSS ANATOMY FOR PHYSICAL THERAPISTS (Physical Therapy 191) (6). Prerequisites: Biology 11 and Biology 45 or equivalents and permission of instructor. Fundamental principles and concepts of human gross anatomy for physical therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. *3 lecture and 6 laboratory hours a week. Fall.* Lay.

192. GROSS ANATOMY FOR OCCUPATIONAL THERAPISTS (Occupational Therapy 192) (4). Prerequisites: Biology 11 and Biology 45 or equivalents and permission of instructor. Fundamental principles and concepts of human gross anatomy for occupational therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. *3 lecture and 2 laboratory hours a week. Fall.* Lay.

193. FUNCTIONAL NEUROANATOMY (Physical Therapy 193) (3). Prerequisites: Anatomy 191, Anatomy 107 or equivalent and permission of instructor. Study of basic structure of the brain and spinal cord, including both lecture and laboratory. *4 hours a week.* Primarily for students of physical therapy. *Spring, summer.* Krebs.

202ab. BIOLOGICAL ELECTRON MICROSCOPY (Dentistry 202ab) (2). Prerequisite: permission of instructor. *Conference, 30 hours.* Peach.

204. CONGENITAL MALFORMATION OF THE OROFACIAL REGION (Dentistry O.B. 204) (1). Prerequisite: permission of instructor. *Spring.* Staff.

207. REGIONAL ANATOMY (3). Prerequisite: permission of instructor. For students of oral surgery, surgical residents, graduate students. *2nd session, summer.* Montgomery.

212ab. CYTOCHEMISTRY AND HISTOCHEMISTRY (Dentistry O.B. 212ab) (2). Prerequisite: permission of instructor. Hanker, staff.

222. SEMINAR IN STRUCTURAL AND HARD TISSUE PROTEINS (Dentistry O.B. 222) (1). Prerequisite: permission of instructor. *Spring.* Mechanic.

233ab. CURRENT TOPICS IN BASIC SCIENCE (Dentistry O.B. 233ab) (3, 3). Primarily for dental students. Open to a few anatomy students with permission of instructor. *Conference, 60 hours. Fall and spring.* Staff.

### *Courses for Students in The School of Medicine and Open to Suitably Qualified Graduate Students*

102. HUMAN HISTOLOGY (4). Prerequisites: Biology 21, 21L, Chemistry 11A, 11L, 21A, 21L, 61, 62; Physics 24, 25, or equivalent permission of instructor. Introduction to the study of cells, organized tissues and organ systems at levels of the light and electron microscopes with emphasis on human material. *Fall.* MacRae, staff.

107ab. GROSS ANATOMY (7). Prerequisite: permission of instructor. Primarily for medical students. Graduate enrollment limited by availability of space and material. *1 lecture, 6 laboratory hours, fall; 2 lectures, 6 laboratory hours, 8 weeks of spring.* Henson, staff.

*Courses Primarily for Graduate Students*

101. NEUROANATOMY (Neurobiology 101) (5). The central nervous system and organs of special sense. *3 lecture and 4 laboratory hours a week. Spring.* Rustioni.

103. EMBRYOLOGY (2). Prerequisite: permission of instructor. An introductory study of normal and abnormal human development, including fertilization, cleavage, placentation, early body formation and organogenesis. *Spring.* Mayberry, Koch.

103L. EMBRYOLOGY LABORATORY (2). Prerequisite: permission of instructor. Lecture topics in Anatomy 103 will be expanded through discussions, demonstrations, and practical laboratory experiences. Course to run concurrently with Anatomy 103. *Spring.* Mayberry, Koch.

106. THE CELL (3). Prerequisite: permission of the instructor. Comprehensive introduction to cell structure and function. Emphasis on membrane organization, organelles, the cytoskeleton, cell recognition and the regulation of cell growth including cancer cell biology. Jacobson, Burridge; staff.

112. HUMAN ORIGINS (Anthropology 112) (3). An introductory survey of physical anthropology, including the place of man among the primates, human evolution, and racial differences. Consideration is also given to osteology and the inter-relationship of cultural and biological factors. *3 lecture hours a week. Fall.* Holcomb.

114. DEVELOPMENTAL TISSUES INTERRELATIONSHIPS (2). Prerequisite: permission of instructor. Lectures and seminar discussions on the development, differentiation and interaction of embryonic and adult tissues. *Fall.* Koch.

115. HUMAN GENETICS AND EVOLUTION (Anthropology 115) (Genetics 115) (3). Fundamental principles of genetics; population genetics; factors of evolution; race and species formulation; evolution of primates and man. The interaction of genetics and culture in human behavior, society, and evolution. *3 lecture hours a week. Spring.* Pollitzer.

116. IMAGING IN BIOLOGY — MICROSCOPY (4). Prerequisite: permission of instructor. Geometric and physical optics; the image as an interference pattern; resolution; phase and polarization microscopy; Nomarski interference optics; electron microscopy; ultrasound imaging. *2 lecture and 4 laboratory hours a week. Fall.* Blaurock.

117. IMAGING IN BIOLOGY — DIFFRACTION ANALYSIS (4). Prerequisite: permission of instructor. Analysis of noncrystalline biological structure by means of optical, X-ray, neutron, and electron diffraction; image analysis of two-dimensionally crystalline membranes (purple membrane cytochrome oxidase, gas vesicle); molecular models. *2 lecture and 4 laboratory hours a week. Spring.* Blaurock.

118. NEUROENDOCRINOLOGY (Pharmacology 118) (Neurobiology 118) (2). Prerequisite: permission of instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. *Spring. (1982 and alternate years).* Stumpf, Sar.

119. FUNCTIONAL ANATOMY OF MAMMALIAN REPRODUCTION (3). Prerequisite: permission of instructor. Structural and functional basis of mammalian reproduction, including sex differentiation, germ cells and fertilization, reproductive cycles, pregnancy and lactation and artificial control of reproduction. *Spring (1983 and alternate years).* Petrusz.

120. ADVANCED CHORDATE ANATOMY & BIOLOGY (5). Prerequisite: Biology 63. This course will consider vertebrate origins, diversity and evolution. The origins and evolution of the vertebrate classes are considered from the perspective of the anatomical and physiological problems encountered in the shift from one way of life to another. *Fall.* Lay.

122. DEVELOPMENTAL NEUROBIOLOGY (3). Prerequisite: permission of the instructor. A comprehensive overview of nervous system development including detailed analysis of selected topics in developmental neuroanatomy. *Spring (1983 and alternate years).* Lauder.

123. DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Toxicology 123) (2). Prerequisites: basic biology and permission of the instructor. A review of aspects of development which are particularly susceptible to teratogenic insults. Mechanisms by which teratogens affect development will be emphasized. *Spring (1982 and alternate years).* Johnston, Pratt.

200ab. ADVANCED GROSS ANATOMY (4 + 4). Prerequisite: Anatomy 107 and permission of instructor. Detailed dissection of the human body. Specific regions may be selected; topics will include phylogeny and topographic and radiographic anatomy. *8 hours/week per region, Fall and spring.* Henson.

209. ELECTRON MICROSCOPY — PRINCIPLES AND APPLICATIONS (5). Prerequisite: permission of instructor. Introduction to modern techniques of specimen preparation used in EM. Laboratory training in operating scanning and transmission electron microscopes, freeze-fracturing, thin sectioning, metal shadowing and darkroom procedures. *1 lecture and 8 laboratories a week. Fall.* Staff.

301. SEMINAR IN GENERAL ANATOMY (1). A series of weekly lecture-seminars by faculty members and visiting scientists on current research in anatomy. *1½ hours per week. Fall and spring.* Staff.

310. RESEARCH (2 or more). Credit to be arranged in individual cases. *Fall, spring, summer sessions.* Staff.

315. RESEARCH LABORATORY APPRENTICESHIP (3). Prerequisites: permission of instructor and enrollment in the Anatomy Graduate Program. A course for first and second year graduate students in Anatomy consisting of a research project of limited scope pursued under the supervision of a faculty member. *Fall, spring, summer.* Staff.

# The Department of Anesthesiology

The Department of Anesthesiology at The University of North Carolina is structured to meet the needs of patients for anesthetic care. Anesthesiology is defined as the practice of medicine dealing with, but not limited to the provision of insensibility to pain during surgical, obstetrical, therapeutic and diagnostic procedures, and the management of patients so affected; the monitoring and restoration of homeostasis during the perioperative period, as well as homeostasis in the critically ill, injured, or otherwise seriously ill patients; the diagnosis and treatment of painful syndromes; the clinical management and teaching of cardiac and pulmonary resuscitation; the evaluation of respiratory function and application of respiratory therapy in all forms; the supervision, teaching, and evaluation of performance of both medical and paramedical personnel involved in anesthesia, respiratory and intensive care; the conduct of research at the clinical and basic science level to explain and improve the care of patients insofar as physiologic function and the response to drugs is concerned; and the administrative involvement in hospitals and medical schools necessary to implement these responsibilities.

## PROFESSORS

R. W. VAUGHAN (Chair), M.D., University of Texas-Southeastern, 1966

K. J. LEVIN, M.D., University of Vermont at Burlington, 1961

R. A. MUELLER, M.D., Ph.D., University of Minnesota at Minneapolis, 1965, 1966

J. F. PATTERSON, Jr. (Emeritus), M.D., Harvard University, 1942

K. SUGIOKA, M.D., Washington University, 1949

J. N. GHIA, M.D., University of Bombay, India, 1961

E. R. KAFER, M.D., University of Sydney, Australia, 1970

E. S. MANN, M.D., Cornell University, 1969

E. A. NORFLEET, M.D., University of North Carolina at Chapel Hill, 1970

D. H. SPRAGUE, M.D., Albany Medical College, 1969

C. B. WATSON, M.D., University of Maryland at Baltimore, 1973

## ASSOCIATE PROFESSORS

B. C. CORKE, M.B.Ch.B., University of Sheffield, England, 1961

## ASSISTANT PROFESSORS

A. A. BECHTOLDT, Jr., M.D., Yale University, 1961

E. W. DAVIDIAN, M.D., University of North Carolina at Chapel Hill, 1968

C. M. HUNT, M.D., Wake Forest University, 1973

R. A. KATES, M.D., Emory University, 1977

F. J. SPIELMAN, M.D., Medical College of Georgia, 1978

E. P. TYLER, M.D., Temple University, 1979

I. R. WOODSIDE, M.D., Jefferson Medical College, 1977

## VISITING ASSISTANT PROFESSOR

A. MACKIE, F.F.A.R.C.S., Royal College of Surgeons, London, 1982

## ADJUNCT INSTRUCTOR

C. MURPHY, B.Ed., Delta State College, 1960

## CLINICAL ASSOCIATE PROFESSORS

S. GROSSHANDLER, M.D., Ohio State University, 1955

. N. MILLER, M.D., University of Sydney, Australia, 1962 (terminated November 30, 1983)

## CLINICAL ASSISTANT PROFESSORS

V. ANDRACCHIO, M.D., Jefferson Medical College, 1956

C. D. KIRK, M.D., University of North Carolina at Chapel Hill, 1969

L. M. ESTACIO, M.D., Far Eastern University, Philippines, 1965

D. HAMMER, M.D., Tufts University, 1962

J. S. PACE, M.D., University of Miami, 1971

F. E. SISKO, M.D., University of Tennessee at Memphis, 1974

H. R. VEST, M.D., University of Virginia at Charlottesville, 1971

## CLINICAL INSTRUCTORS

D. C. BRIGHT, M.D., University of North Carolina at Chapel Hill, 1971

B. COFFER, M.D., University of North Carolina at Chapel Hill, 1969

W. E. DANIEL, Ph.D., M.D., University of North Carolina at Chapel Hill, 1972, 1979

A. R. GRATTA, A.A.S., Westchester Community College, 1969

M. E. KILEFF, M.B.Ch.B., University of Birmingham, England, 1971

P. MODROW, M.D., University of North Carolina at Chapel Hill, 1965

D. C. OBERLIN, M.D., Stanford University, 1976

V. O. ROBERSON III, M.D., University of North Carolina at Chapel Hill, 1971

R. N. VALLECILLO, M.D., Havana Medical School, Cuba, 1950

P. R. WOODARD, M.D., University of North Carolina at Chapel Hill, 1979

# The Department of Biochemistry and Nutrition

Biochemists study living organisms utilizing principally chemical and physical methods with many biological techniques such as genetics to understand life. We are proud to have strong research in molecular biology and chromatin structure; in biochemical genetics of virus, bacteria, yeast and mammals; in membrane structure and calcium transport; in neuro-chemistry; in physical biochemistry and blood clotting; in hormones and their receptors; in cytoskeleton assembly; in enzymology and enzyme regulation; in metabolic diseases as well as studies on the biochemical action of toxic agents and drug development. Although we teach nutrition, we do not have an active research program in this area. The research interests of the faculty are broad and listed in the graduate school catalogue; detailed information concerning the research publications of our faculty is available in the American Chemical Society *Directory of Graduate Research* or can be obtained from the Director of Graduate Studies.

Medical students can carry out limited research studies with individual faculty members or they can participate in extended biochemical research in the M.D.–Ph.D. program.

## PROFESSORS

M. E. JONES (Chair) (Kenan Professor of Biochemistry and Nutrition), Ph.D., Yale University, 1951

M. K. BERKUT (Emeritus), Ph.D., University of North Carolina at Chapel Hill, 1953

M. CAPLOW, D.D.S., New York University, 1959; Ph.D., Brandeis University, 1963

D. T. FORMAN, Ph.D., Wayne State University, 1959

E. B. GLASSMAN, Ph.D., Johns Hopkins University, 1955

J. HERMANS, Ph.D., University of Leiden, Netherlands, 1958

J. L. IRVIN, (Kenan Professor of Biochemistry and Nutrition), Ph.D., University of Pennsylvania, 1938

M. A. LIPTON, Ph.D., University of Wisconsin 1939; M.D., University of Chicago, 1948

R. L. LUNDBLAD, Ph.D., Washington Univer sity, 1965

G. L. MECHANIC, Ph.D., New York University 1958

P. MORELL, Ph.D., Albert Einstein College c Medicine, 1968

S. N. NAYFEH, Ph.D., University of North Carc lina at Chapel Hill, 1964

R. PENNIALL, Ph.D., University of Iowa, 195

C. PIANTADOSI, Ph.D., University of Nort Carolina at Chapel Hill, 1956

H. A. SCHNEIDER (Emeritus), Ph.D., Universit of Wisconsin, 1938

G. K. SUMMER, M.D., Harvard University, 19

R. H. WAGNER, Ph.D., University of Cincinnati, 1950

J. R. WHITE, Ph.D., Stanford University, 1953

J. E. WILSON, Ph.D., Cornell University, 1948

R. V. WOLFENDEN: (Alumni Distinguished Professor of Biochemistry and Nutrition), Ph.D., Rockefeller Institute, 1964

## ASSOCIATE PROFESSORS

F. E. BELL, Ph.D., Emory University, 1957

C. W. CARTER, Jr., Ph.D., University of California, San Diego, 1972

C-B. CHAE, Ph.D., University of North Carolina at Chapel Hill, 1967

S. G. CHANEY, Ph.D., University of California, Los Angeles, 1970

P-W. CHENG, Ph.D., Case Western Reserve University, 1974

. GRIFFITH, Ph.D., California Institute of Technology, 1969

D. J. HOLBROOK, Jr., Ph.D., University of North Carolina at Chapel Hill, 1959

S. R. LENTZ, Ph.D., Cornell University, 1973

G. W. MEISSNER, Ph.D., Technical University, Berlin, Germany, 1965

A. SANCAR, M.D., Istanbul Medical School, 1969; Ph.D., University of Texas, Dallas, 1977

M. D. TOPAL, Ph.D., New York University, 1973

## ASSISTANT PROFESSORS

C. W. BURRIDGE, Ph.D., Cambridge University, 1975

M. M. FRIED, Ph.D., Cornell University, 1977

. F. MANESS, Ph.D., University of Texas, Houston, 1975

. I. SWANSTROM, Ph.D., University of California, Irvine, 1975

W. TRAUT, Ph.D., University of Southern California, 1974

## RESEARCH PROFESSORS

. J. DOMNAS, Ph.D., Illinois Institute of Technology, 1956

D. G. KAUFMAN, M.D., Washington University, St. Louis, 1968; Ph.D., 1973

D. W. STAFFORD, Ph.D., University of Miami, 1964

## RESEARCH ASSOCIATE PROFESSORS

J. A. CIDLOWSKI, Ph.D., Medical College of Georgia, 1975

R. E. CROSS, Ph.D., University of Florida, 1971

J. E. HAMMOND, Ph.D., University of Florida, 1974

E. M. WILSON, Ph.D., Vanderbilt University, 1974

W. W. YOUNGBLOOD, Ph.D., Oklahoma University, 1969

## RESEARCH ASSISTANT PROFESSORS

S. E. GENNICK, Ph.D., Wayne State University, 1979

M. J. GRIFFITH, Ph.D., University of Texas, San Antonio, 1977

J-C. LIN, Ph.D., Temple University, 1974

G. B. SANCAR, Ph.D., University of Texas, Dallas, 1977

L. M. SILVERMAN, Ph.D., Ohio State University, 1975

A. D. TOEWS, Ph.D., Ohio State University, 1974

## ADJUNCT PROFESSOR

T. A. KRENITSKY, Ph.D., Cornell University, 1963

## ADJUNCT ASSOCIATE PROFESSORS

T. DAMSTRA, Ph.D., University of Chicago, 1969

F. A. DOMBROSE, Ph.D., Wayne State University, 1972

S. S.-L. LI, Ph.D., University of Missouri, 1968

G. W. LUCIER, Ph.D., University of Maryland, 1970

C. M. SCHILLER, Ph.D., University of Texas, Dallas, 1970

B. R. SWITZER, Ph.D., University of North Carolina at Chapel Hill, 1971

## ADJUNCT ASSISTANT PROFESSOR

D. M. FRAZIER, Ph.D., Duke University, 1969

## POSTDOCTORAL FELLOW/TRAINEES

C-A. Ohmstede; R. M. Robinson

## CURRICULUM

Courses offered by the Department of Biochemistry and Nutrition are available to students majoring in other scientific disciplines, such as students interested in an A.B. degree in Chemistry or Biology, with emphasis on Biochemistry.

### *Courses for Health Professionals other than Medical Students*

7. INTRODUCTION TO BIOCHEMISTRY (4). Designed to meet the needs of pre-nursing students, pre-dental hygiene students and students in the medical allied health professions. Covers general and organic chemistry. *3 lecture hours and 1 2-hour laboratory a week. Breakage deposit required. Fall.* White.

8. INTRODUCTION TO BIOCHEMISTRY (4). Prerequisite: Biochemistry 7 or equivalent. Designed to meet the needs of prenursing students, pre-dental hygiene students and students in the medical allied health professions. Covers basic aspects of biochemistry. *3 lecture hours and 1 2-hour laboratory a week. Breakage deposit required. Spring.* Penniall, Wilson.

22. FUNDAMENTALS OF NUTRITION (2). Prerequisites: one course in biology or chemistry and permission of the instructor. A small group seminar course with emphasis on assessing and choosing what you eat using a variety of criteria including the biochemical basis of nutrient need and a computer approach. *2 lecture hours or group discussions a week. Spring.* Glassman.

40. BIOCHEMISTRY OF NUTRITION (2). Prerequisites: Chemistry 11, 11L and 21, 21L. A study of the science of nutrition with emphasis on: food, its nutrients and their relation to health; the biochemical or physiological role of required dietary nutrients; and the relevance of nutrition in preventive dentistry. *Fall.* Glassman.

66. BIOCHEMISTRY FOR PHARMACY STUDENTS (4). Prerequisites: Chemistry 61, 62 or equivalent. Lectures and recitation concerning the chemistry of biological molecules important in the processes of the living organism. Includes consideration of: enzymes, energetics, metabolism of carbohydrates, lipids, nucleic acids, proteins and other nitrogen compounds; vitamins as coenzymes; metabolic regulation, biochemical genetics and role of biochemistry in drug design. *Spring.* Piantadosi.

101a. BIOCHEMISTRY FOR DENTAL STUDENTS (2). Prerequisites: Chemistry 62, or equivalent. This course may be taken by qualified students who are not majoring in biochemistry. *Fall.* Bell, staff.

101b. BIOCHEMISTRY FOR DENTAL STUDENTS (2). Continuation of 101a. *Spring.* Bell, staff.

*Courses for Graduates and Advanced Undergraduates*

100. BIOCHEMISTRY FOR STUDENTS OF BIOLOGY AND CHEMISTRY (Chemistry 130) (Neurobiology 100) (Biology 107) (3). Prerequisites: Chemistry 61 and one course in biology; corequisite: Chemistry 62. Lectures on the mechanism and regulation of reactions in living organisms, with emphasis on general principles. Protein structure and enzyme function; central pathways in intermediary metabolism; metabolic control; expression of genetic information; molecular disease. *Fall.* Wolfenden.

100L. BIOCHEMISTRY LABORATORY (2). Prerequisite or corequisite: Biochemistry 100. Laboratory for Biochemistry 100. Includes experiments on cell growth, subcellular fractionation, isolation and kinetic studies on enzymes, intermediary metabolism; preparation and biosynthesis of macromolecules, fractionation of lipids, utilizing modern research techniques in biochemistry. *4 laboratory hours a week, fall.* Toews.

104. INTERMEDIARY METABOLISM (3). Prerequisite: Biochemistry 100 or equivalent. Selected metabolic pathways which illustrate how biochemical reactions are organized, catalyzed and regulated. *Spring.* Jones, Penniall, Traut, Wilson, Wolfenden.

105. MOLECULAR BIOLOGY (3). Prerequisites: Biochemistry 100 or equivalent. Mechanisms or replication, transcription, and translation of genetic material in procaryotic and eucaryotic systems, gene sequence and organization, biochemical genetics, and regulatory mechanisms. *Fall.* Chae, Fried, Sancar.

106. ENZYME KINETICS (1). Prerequisite: Biochemistry 100 or equivalent. An analysis of enzyme-catalyzed multiple substrate reactions, the kinetic characteristics of allosteric enzymes, and methods for studying control of reaction in intact cells. *Spring.* Jones, White.

108. LIPID AND MEMBRANE BIOCHEMISTRY (3). Prerequisite: Biochemistry 100 or equivalent. Chemistry and structure of complex lipids and lipoproteins; cellular fractionation; membrane structure, transport and assembly; cell surface mediated processes. *Fall.* Lentz, Meissner.

134. CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3). Prerequisite: Biochemistry 100 or equivalent. Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, and ATP enzymology. *Fall.* Carter, Caplow.

140. INTRODUCTION TO CHEMICAL PATHOLOGY (Chem Path 140) (3). Prerequisite or corequisite; Biochemistry 100 or equivalent. Permission of the instructor. Introduction to chemical pathology including the biochemical basis, methods of analysis, and clinical application of selected biochemical tests. Topics may include enzymology, endocrinology, clinical toxicology/pharmacology, immunochemistry or other related areas. *3 lecture hours per week, spring. (1985 and alternate years).* Chapman, Silverman, Cross, Hammond, Forman.

142. BIOCHEMICAL TOXICOLOGY (Toxicology 142) (3). Prerequisite: Biochemistry 100, and one additional biochemistry course (or permission of course director). Biochemical actions of toxicants, and assessment of cellular damage by biochemical measurements. Course intended primarily for graduate students. *Spring.* Holbrook (Course Director).

143. PHYSICAL BIOCHEMISTRY (2). Prerequisites: Biochemistry 100 and two semesters of physical chemistry. Theory and methods applicable to the study of macromolecules. Topics will include: spectroscopy, applications of random-walk theory, scattering of light and x-rays, frictional properties and fast kinetic measurements. *2 lecture hours per week; plus occasional practical demonstrations. Spring. (1985 and alternate years).* Hermans.

144. PHYSICAL BIOCHEMISTRY (2). Prerequisites: Biochemistry 100 and two semesters of physical chemistry. Theory and methods applicable to the study of macromolecules. Topics will include: conformational analysis, multiple equilibria and magnetic resonance spectroscopy. *2 lecture hours per week; plus occasional practical demonstrations. Spring. (1986 and alternate years).* Hermans.

180. DNA AND CELL PATHOLOGY (Genetics 180) (Pathology 180) (3). Prerequisite: Biochemistry 100 and permission of the instructor. The basic chemistry of DNA and its associated structural and replicative proteins as it relates to mechanisms of mutagenesis and carcinogenesis. *3 lecture hours a week. Spring.* Topal.

### *Courses for Graduate Students*

205. RESEARCH TOPICS IN BIOCHEMISTRY (3). Prerequisites: Biochemistry 100 or equivalent, and permission of the coordinator. Seminar and critical study of modern research topics in biochemistry under the supervision of individual biochemistry faculty. *Spring.* Nayfeh, staff.

207. ADVANCED BIOCHEMISTRY LABORATORY (4). Prerequisites: Biochemistry 100 or equivalent. A laboratory course designed to acquaint graduate students majoring in biochemistry with the equipment and methods used in modern biochemical research. *12 laboratory hours a week, either semester.* Staff.

211. APPLICATION OF DIGITAL COMPUTERS IN BIOCHEMICAL RESEARCH (2). Prerequisite: Permission of the instructor. Use of computers for automated collection, transmission and processing of research data for instrumental control and for evaluation of theoretical models. In alternate years, course will be offered at different level; it may be repeated once for credit. Maximum number of students admitted will be determined by availability of equipment. *Spring.* Hermans.

220. BIOCHEMICAL ENDOCRINOLOGY (2). Prerequisite: Biochemistry 100 or equivalent. Review of endocrine systems and their clinical expression in disease; molecular mechanisms of hormone action; biochemical basis of growth factors and second messengers; recombinant DNA-cloning methods. *Spring.* Wilson, Nayfeh, Cidlowski.

227. NEUROCHEMISTRY (Neurobiology 227) (3). Prerequisite: two semesters of biochemistry. An introductory course in the biochemistry of the nervous system. Topics include aspects of energy metabolism, ion movements, neurotransmitters, intermediary metabolism and the metabolism of macromolecules in the nervous system. *Fall.* (1984 and alternate years). Wilson, Morell.

228. ADVANCED TOPICS IN PROTEIN CHEMISTRY (Pathology 228) (3). Prerequisites: Biochemistry 100 or equivalent. A discussion of the chemical approaches to the elucidation of the structure of simple and complex proteins. Special topics will include comparisons of the crystal structure of proteins with functional group reactivity and susceptibility to limited proteolysis. *Spring. (1985 and alternate years).* Lundblad.

*Seminar Series*

The following seminar courses are designed for students who are majoring or minoring in biochemistry and who wish to further their knowledge in particular areas. Unless otherwise stated, two semesters of biochemistry are prerequisites for seminar courses. Most of these courses are given in alternate years by interested staff members. Unless otherwise stated, these seminars may not be repeated for credit. Seminar courses provide teaching experience which is required for a graduate degree in Biochemistry and Nutrition in addition to experience in giving a critical review of the current literature.

230. SEMINAR IN MEMBRANE STRUCTURE AND FUNCTION (2). Prerequisites: Biochemistry 108 and permission of the instructor. Students organize and present in depth seminars in selected areas of modern membrane research. *Spring. (1985 and alternate years).* Lentz, Meissner.

232. SEMINAR IN STRUCTURE AND FUNCTION OF CHROMATIN AND GENES (2). Prerequisite: Biochemistry 105 or equivalent. Covers the structural organization of chromatin and eucaryotic genes as well as regulations of gene transcription. *Fall. (1984 and alternate years).* Chae; staff.

233. SEMINAR IN PROTEIN STRUCTURE AND FUNCTION (2). *Spring. (1986 and alternate years).* Traut.

234. SEMINAR IN PROTEIN BIOSYNTHESIS (2). Prerequisite: Biochemistry 105 or equivalent. *Spring. (1985 and alternate years).* Bell, Chaney, Fried.

235. SEMINAR IN CHEMICAL NEUROBIOLOGY (Neurobiology 235) (2). *Fall. (1985 and alternate years).* Wilson, Morell.

236. SEMINAR ON PROTEIN INTERACTIONS IN BLOOD COAGULATION (2). *Fall. (1985 and alternate years).* Hermans.

237. SEMINAR IN OXYGEN METABOLISM AND TOXICITY (2). Subject matter will depend on interests of the participants. *Fall. (1984 and alternate years).* White.

238. SEMINAR IN METAL METABOLISM AND TOXICITY (2). Emphasizes the metabolic role of transition metals and the origin of their toxic effects. Subject matter will depend on the interests of participants. *Fall. (1985 and alternate years).* White.

239. SEMINAR IN BIOCHEMICAL RESPONSE AND PROTECTIVE ACTIONS TO TOXIC SUBSTANCES (2). Discussions of current biomedical literature of the biochemical responses and protective actions to toxic substances by mammalian systems. *Fall. (1984 and alternate years).* Holbrook.

240. SEMINAR ON MYELIN (2). Prerequisite, any two courses in biochemistry. *Spring. (1986 and alternate years).* Morell.

241. SEMINAR ON SPECIAL TOPICS IN BIOCHEMICAL RESEARCH (2). Covers areas of biochemical research that are currently active and productive. Specific subjects will be announced. May be repeated for credit. *(Either semester as announced).* Staff.

242. SEMINAR IN CLINICAL BIOCHEMISTRY (2). Prerequisite: permission of instructor. Current topics in clinical biochemistry including analytical methodologies and clinical interpretation. *Summer.* Silverman.

243. SEMINAR IN PROTEIN PHOSPHORYLATION (1). *Fall. (1984 and alternate years).* Penniall.

244. SEMINAR IN USE OF MAXIMUM ENTROPY METHODS IN IMAGE FORMATION (2). Prerequisite: permission of instructor. Image formation is treated from a quite general point of view, drawing from Fourier transform methods used in X-ray crystallography, but also including tomographic methods. Conceptual unities will be stressed. *Spring. (1986 and alternate years).* Carter.

245. SEMINAR IN CELL-CELL INTERACTIONS (2). Molecular basis of eucaryotic cell-cell interactions occurring developmentally. *Spring.* Maness.

246. SEMINAR IN BIOCHEMICAL MECHANISMS OF ANTICANCER AGENTS (2). Prerequisite: one semester of biochemistry. *Spring. (1986 and alternate years).* Chaney.

247. SEMINAR IN GLYCOPROTEIN BIOSYNTHESIS AND DEGRADATION (2). *Spring. (1985 and alternate years).* Cheng.

248. SEMINAR IN INSULIN AND RECEPTOR CELLS (1). *Spring. (1986 and alternate years).* Penniall.

249. SEMINAR ON ENZYME REGULATION (2). *Spring. (1985 and alternate years).* Jones.

250. SEMINAR IN BIOCHEMISTRY OF THE CYTOSKELETON (2). *Spring. (1986 and alternate years).* Caplow.

251. SEMINAR IN DNA-PROTEIN INTERACTIONS (2). Review of current literature on kinetic and structural aspects of binding to DNA of proteins involved in replication, regulation, recombination and repair. *Spring.* Sancar.

252. SEMINAR ON CURRENT TOPICS IN CLINICAL NUTRITION (2). Prerequisite: one semester of biochemistry. Topics of current interest with respect to the role of nutrition in the prevention and/or treatment of disease with a strong emphasis toward understanding the underlying biochemical principles. *Spring. (1985 and alternate years).* Chaney, Frazier.

253. SEMINAR ON ARCHITECTURE AND MECHANISM OF ACTION OF ACTIVE SITES (2). Techniques for investigating the 3-dimensional configuration of binding and catalytic centers experimentally; strategies involved in transition state stabilization by enzymes of different classes; design of mechanism-based metabolic inhibitors. *Spring. (1985 and alternate years).* Wolfenden.

254. SEMINAR IN INTERACTION OF ORGANIC AND BIOMOLECULES WITH SOLVENT WATER (2). Strengths and directional preferences of solute-solvent interactions; their influence on structures of macromolecules and their assemblies, on metabolic free energies, on enzyme catalysis, and on membrane transport processes. *Spring. (1986 and alternate years).* Wolfenden.

255. SEMINAR ON CONTROVERSIES IN HUMAN NUTRITIONAL REQUIREMENTS (2). Prerequisite: one semester of biochemistry. Current research into the biochemical role of nutrients in the body and determination of nutritional requirements. *Spring. (1986 and alternate years).* Chaney, Frazier.

275. GENETICS SYSTEMS (Microbiology 275, Genetics 275, Biology 275, Pathology 275) (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. Required of all candidates for the degree in Genetics. *Fall. (1984 and alternate years).* Staff.

301, 302. RESEARCH IN BIOCHEMISTRY (3 or more). Prerequisite: permission of the department. *6 or more hours a week, throughout both semesters, when requested.* Staff.

310. RESEARCH IN NEUROBIOLOGY (Neurobiology 310, Pathology 310, Pharmacology 310, Physiology 310, Biology 310, Psychology 310) (3–12). Prerequisite: permission of the Graduate Student Advisor, Curriculum in Neurobiology. Research in various aspects of neurobiology. *6–24 hours a week, fall and spring.* Faculty of the Neurobiology Program.

393. MASTER'S THESIS (3 or more). Staff.

394. DOCTORAL DISSERTATION (3 or more). Staff.

400. GENERAL REGISTRATION (0).

# *The Department of Dermatology*

The mission of the Department of Dermatology is to do the best possible job of teaching, patient care, research and administration in areas concerning the skin and its diseases. Clinical teaching of medical students and residents takes place on the inpatient, outpatient, and consultation services of North Carolina Memorial Hospital and at various outlying clinics. Medical student teaching is largely done in the introductory course for sophomores and the senior elective. There is emphasis on teaching of residents and continuing education for practicing physicians. Special clinical interests of faculty include skin cancers, bullous, viral, papulosquamous, acneiform and connective tissue diseases, eczemas and erythemas. Basic research includes epidermal-dermal relationships, structure and function of the epidermal-dermal junction, epidermal cell membranes, blister formation and leukocyte chemotaxis. Clinical investigation includes topical antibiotics for acne, topical corticosteroids for psoriasis and treatments for warts. Administration facilitates and provides a pleasant atmosphere for the above activities.

## PROFESSORS

C. E. WHEELER (Chair), M.D., University of Wisconsin at Madison, 1941

R. A. BRIGGAMAN, M.D., New York University, 1960

## ASSOCIATE PROFESSORS

W. R. GAMMON, M.D., University of North Carolina at Chapel Hill, 1971

E. J. O'KEEFE, M.D., Yale University, 1966

## ASSISTANT PROFESSORS

R. S. TOMSICK, M.D., University of North Carolina at Chapel Hill, 1976 (leave of absence 8/1/83 - 7/31/84)

D. T. WOODLEY, M.D., University of Missouri, 1973

## CLINICAL PROFESSORS

H. Z. LUND (Emeritus), M.D., University of Pennsylvania, 1931

G. W. CRANE, Jr., M.D., Northwestern University, 1945

## CLINICAL ASSOCIATE PROFESSORS

S. W. BAREFOOT, M.D., Duke University, 193

R. S. GILGOR, M.D., University of Pennsylvania, 1962

G. GRAHAM, M.D., Wake Forest University, 1961

F. M. HOUSTON, M.D., Louisiana State University, 1964

E. P. KANOF, M.D., New York University, 196

E. D. LUPTON, M.D., New York University, 193

## CLINICAL ASSISTANT PROFESSORS

H. ARRINGTON III, M.D., Tulane University, 967

. N. DAVIS, M.D., Duke University, 1962

1. J. DONAHUE, M.D., Creighton University, 967

L. FARMER, Jr., M.S., Duke University, 1955

. E. FRASER, Jr., M.D., Medical College of Virnia, 1956

B. GRIFFIN, M.D., University of Pennsylvania, 961

H. HALL, M.D., Duke University, 1964

. R. HENDERSON, M.D., Indiana University, 961

B. LEVY, M.D., Georgetown University, 1971

. S. LOGAN, M.D., Duke University, 1968

. S. MILLER, M.D., University of North Caroa at Chapel Hill, 1961

. A. PHILLIPS, M.D., Jefferson Medical Colge, 1947

H. REID, M.D., Medical University of South arolina, 1973

. W. SCOTT, M.D., University of North Caroa at Chapel Hill, 1962

J. STANLEY, M.D., University of North Caroa at Chapel Hill, 1972

J. A. THOMPSON, Jr., M.D., Wake Forest University, 1967

W. H. TURNER, M.D., Medical College of Virginia, 1968

H. V. VELSOR, M.D., Albany Medical College, 1947

## CLINICAL INSTRUCTORS

A. CHIARAMONTI, M.D., University of Michigan, 1976

C. H. KASSENS, M.D., Washington University, 1973

J. C. LONG, M.D., University of North Carolina at Chapel Hill, 1973

S. B. PRATT, M.D., Medical College of South Carolina, 1966

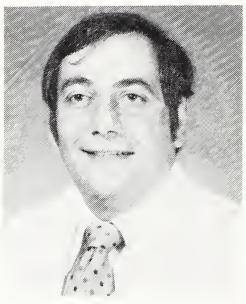
S. O. TAFEEN, M.D., Upstate Medical Center, 1974

D. E. TART, M.D., University of North Carolina at Chapel Hill, 1974

P. P. WESTMORELAND, M.D., Medical College of South Carolina, 1971

C. NOLAN, Jr., M.D., University of North Carolina at Chapel Hill, 1974

# The Department of Family Medicine



The Department of Family Medicine endeavors to educate family physicians to meet the needs of the state of North Carolina, and to provide support for practicing physicians through development of educational programs and availability of consultations. The department also participates actively in the academic environment of the UNC School of Medicine through teaching, research and other scholarly pursuits. The Department of Family Medicine teaches in conjunction with a statewide network of family physician preceptors and offers a variety of learning opportunities which introduce the principles of family medicine to all medical students. These opportunities also allow interested students to get more indepth experience in the specialty.

## PROFESSORS

E. J. SHAHADY (Chair), M.D., West Virginia University, 1964

R. M. BAKER, M.D., Case Western Reserve University, 1965

W. L. FLEMING (Emeritus), M.D., Vanderbilt University, 1932

D. L. MADISON, M.D., Loma Linda University, 1965

E. S. MAYER, M.D., Columbia University, 1964

W. P. RICHARDSON (Emeritus), M.D., Medical College of Virginia, 1928

C. G. SHEPS, M.D., University of Manitoba, Canada, 1936

F. T. STRITTER, Ph.D., Syracuse University, 1968

R. F. WALTON, M.D., Queen's University, Canada, 1961

## ASSOCIATE PROFESSORS

M. C. BATTIGELLI, M.D., University of Florence, Italy, 1951

J. A. BRYAN II, M.D., University of Pennsylvania, 1957

D. M. CASSATA, Ph.D., University of Minnesota, 1973

B. E. COGSWELL, Ph.D., University of North Carolina at Chapel Hill, 1965

P. CURTIS, M.R.C.G.P., Royal College of General Practitioners, England, 1975

J. J. FREY, M.D., Northwestern University, 197(

C. P. FRIEDMAN, Ph.D., University of North Carolina at Chapel Hill, 1977

H. T. FRIERSON, Ph.D., Michigan State University, 1974

H. HAMRICK, M.D., University of North Carolina at Chapel Hill, 1967

J. W. LEA, Ph.D., University of North Carolina at Chapel Hill, 1973

W. C. MCGAGHIE, Ph.D., Northwestern University, 1973

P. J. RIZZOLO, M.D., Creighton University, 19

B. STABLER, Ph.D., University of North Carolina at Chapel Hill, 1971

C. A. TAYLOR, M.D., University of Tennessee, 1957

S. L. WARREN, M.D., Medical College of Virginia, 1949

G. T. WOLFF, M.D., Jefferson Medical College, 1952.

## ASSISTANT PROFESSORS

T. A. CABLE, M.D., University of Florida, 1976

M. F. FLEMING, M.D., Wayne State University, 1974

D. GARFINKEL, M.D., Wake Forest University, 1955

R. E. GWYTHER, M.D., Medical College of Ohio, 1975

J. P. MARTIN, M.D., University of Arizona, 1976

P. R. OLSON, M.D., University of Vermont, 1968

D. Y. ROGERS, M.D., Hahnemann University, 1977

P. D. SLOANE, M.D., Medical College of Ohio, 1975

G. STRAYHORN, M.D., University of North Carolina at Chapel Hill, 1977

## LECTURERS

. J. ALUISE, Ph.D., University of North Carolina at Chapel Hill, 1982

S. P. BOGDEWIC, M.A., University of Santa Clara, 1977

B. D. SKINNER, Ph.D., University of North Carolina at Chapel Hill, 1982

L. M. SLATT, M.Ed., University of North Carolina at Chapel Hill, 1978

A. A. TALBOT, M.A., University of North Carolina at Chapel Hill, 1970

## CLINICAL PROFESSORS

D. S. CITRON, M.D., Washington University, 1944

. K. JONES, M.D., Duke University, 1946

. G. JONES, M.D., Wake Forest University, 1959

W. S. JOYNER, M.D., Harvard University, 1952

. G. PATTERSON (Emeritus), M.D., University of Pennsylvania, 1937 (deceased 1984)

R. T. SAKATA, Ph.D., Kent State University, 1970

R. H. SHACKELFORD, M.D., Wake Forest University, 1947

C. M. SHY, M.D., Marquette University, 1962; Dr. P.H. University of Michigan, 1967

H. H. TILSON, M.D., Washington University, 1964; Dr. P.H. Harvard University, 1972

## CLINICAL ASSOCIATE PROFESSORS

J. F. BAUMRUCKER, M.D., University of Cincinnati, 1970

R. H. BILBRO, M.D., University of North Carolina at Chapel Hill, 1966

R. M. BOERNER, M.D., University of North Carolina at Chapel Hill, 1961

W. E. BRUCE, Ph.D., University of Chicago, 1971

L. M. CUTCHIN, M.D., University of North Carolina at Chapel Hill, 1962

W. J. DEANGELIS, Ph.D., M.D., University of Uruguay, 1964, 1959

R. H. HARDIN, M.D., Wake Forest University, 1946

B. R. HOWES, M.S., Eastern Michigan University, 1971

B. S. HULKA, M.D., Columbia University, 1959

H. B. KORNEGAY, M.D., Wake Forest University, 1957

R. E. LANE, M.D., Tulane University, 1967

J. W. LEDBETTER, M.D., Wake Forest University, 1953

B. F. LEVEAU, Ph.D. Pennsylvania State University, 1973

W. R. MARSHALL, Ph.D., Auburn University, 1978

C. P. SCHUCH, M.S., University of Pennsylvania, 1952

J. L. SIGMON, Jr., M.D., University of North Carolina at Chapel Hill, 1966

H. H. SUMMERLIN, M.D., Duke University, 1961

L. S. THORP, M.D., University of Pennsylvania, 1952

B. W. TUCKER, M.D., University of North Carolina at Chapel Hill, 1966

G. R. TUCKER, M.D., University of North Carolina at Chapel Hill, 1955

C. E. WEBB, Pharm.D., University of Tennessee, 1973

M. W. WESTER, M.D., Duke University, 1952

J. R. WHEELING, M.D., Wayne State University, 1964

## CLINICAL ASSISTANT PROFESSORS

J. S. ALBERGOTTI, M.D., University of North Carolina at Chapel Hill, 1955

A. AXELBANK, M.D., Albert Einstein College of Medicine, 1978

R. M. S. BELL, M.B., Ch.B., Birmingham University of England, 1968

N. BEROLZHEIMER, M.S.W., Florida State University, 1974

J. A. BERRY, M.D., Howard University, 1972

F. E. BLALOCK, M.D., University of Tennessee, 1951

J. C. BREWER, M.D., Duke University, 1959

J. CADE, M.D., University of California, 1972

A. T. DAVIS, M.S.W., University of North Carolina at Charlotte, 1980

W. R. DRAKE, Jr., M.D., University of North Carolina at Chapel Hill, 1972

C. T. DURHAM, Jr., M.D., Medical University of South Carolina, 1966

J. DYKERS, M.D., University of North Carolina at Chapel Hill, 1960

C. T. ELLITHORPE, M.D., Wake Forest University, 1970

W. N. EVANS II, M.D., University of Alabama, 1973

P. GAL, Pharm.D., State University of New York, 1977

H. W. GEROCK, M.D., University of North Carolina at Chapel Hill, 1963

J. B. GREENWOOD, M.D., University of Pennsylvania, 1944

G. P. GUITERAS, M.D., University of North Carolina at Chapel Hill, 1969

J. J. HAGGERTY, M.D., University of Maryland, 1971

G. C. HEMINGWAY, Jr., M.D., University of North Carolina at Chapel Hill, 1963

R. R. HENDERSON, M.D., Indiana University, 1961

H. HUSSEY, M.D., Jefferson Medical College, 1942

T. J. IVES, Pharm.D., University of Florida, 1979

C. G. JAMES, M.D., Meharry University Medical School, 1953

J. W. KAHN, M.D., University of Cincinnati, 1942

D. C. KELLER, M.D., Washington University, 1974

J. C. LOWMAN, Ph.D., University of North Carolina at Chapel Hill, 1971

C. C. LUCAS, M.D., University of North Carolina at Chapel Hill, 1969

D. L. MARTIN, M.D., University of Virginia, 1965

T. B. McGHEE, M.D., Medical College of Georgia, 1976

A. J. MOONEY III, M.D., Emory University, 1974

R. J. MURPHY, Jr., M.D., Vanderbilt University, 1940

M. T. PINN, M.D., University of Virginia, 1976

F. POPE, M.B.B.S., University of London, 1963

F. E. RECTOR, M.D., Wayne State University, 1969

T. RUCKER, M.D., Emory University, 1976

A. F. SANCHEZ, Jr., M.D., University of Florida, 1975

W. T. SAWYER, M.S., University of North Carolina at Chapel Hill, 1977

J. L. SCHORR, M.D., Tufts University, 1977

O. J. SEMENOFF, M.D., St. Louis University, 1963

E. P. STILES, M.D., University of North Carolina at Chapel Hill, 1963

J. H. TALLEY, M.D., University of Virginia, 1963

P. L. TEMPLE, M.D., Emory University, 1963

S. M. THROWER, M.S.W., Catholic University of Washington, D.C., 1975

W. R. TURLINGTON, M.D., University of North Carolina at Chapel Hill, 1969

H. V. VICK, M.D., Wake Forest University, 195

D. C. VINSON, M.D., University of North Carolina at Chapel Hill, 1974

## CLINICAL INSTRUCTORS

L. R. ALEXANDER, M.D., Duke University, 195

W. ALLEN, M.D., George Washington University, 1977

A. R. ANDERSON, M.D., University of North Carolina at Chapel Hill, 1977

B. O. BAILEY, M.D., Ohio State University, 197

G. O. BEAN, M.D., Wake Forest University, 1976

R. A. BLOOMFIELD, M.D., University of Maryland, 1970

W. G. CLARK, M.D., University of North Carolina at Chapel Hill, 1978

B. G. CLER, M.D., Indiana University, 1979

R. S. CLINE, M.D., University of North Carolina at Chapel Hill, 1957

A. DAUGIRD, M.D., University of North Carolina at Chapel Hill, 1977

T. E. DILL, M.D., Medical College of Georgia, 1967

. C. FESPERMAN, M.D., University of North Carolina at Chapel Hill, 1977

A. M. FISHER, M.D., University of Wisconsin, 1975

. F. FLAHERTY, D.O., Kansas City College, 1978

R. FISHER, M.D., University of Florida, 1977

P. A. FLEMING, M.D., University of Utrecht, The Netherlands, 1955

R. H. FOREMAN, M.D., University of Cincinnati, 1973

T. E. HAMILTON, M.D., Loma Linda University, 1973

. H. HELLER, M.D., George Washington University, 1973

. B. HOLT, M.D., University of North Carolina at Chapel Hill, 1977

P. G. HOWARD, M.D., University of Virginia, 1955

P. K. H. JESSUP, M.D., Wake Forest University, 1977

M. S. JOHNSON, M.D., New Jersey Medical School, 1979

D. M. KAPLAN, M.D., Medical College of Virginia, 1971

L. A. KELLY, M.D., Columbia University, 1971

C. KLEIN, M.D., University of Pittsburgh, 1979

A. K. KUHNE, M.D., University of North Carolina at Chapel Hill, 1977

W. L. LARIMORE, M.D., Louisiana State University, 1977

. L. LEIGHTON, M.D., New York Medical College, 1976

. H. MACINTOSH, M.D., Duke University, 1975

D. MENSCER, M.D., University of North Carolina at Chapel Hill, 1979

R. A. MERIWETHER, M.D., Medical College of Georgia, 1979

R. S. MEYER, M.D., Temple University, 1974

R. M. MILLER, M.D., University of Tennessee, 1967

J. H. McCALEB, M.D., University of Missouri, 1976

D. L. PRATHER, M.D., University of North Carolina at Chapel Hill, 1978

M. J. QUIGLEY, M.D., Michigan State University, 1973

D. REECE, M.D., Washington University, 1971

S. F. SLATKOFF, M.D., University of Pennsylvania, 1978

D. C. SPENCER, M.D., University of California at Los Angeles, 1977

T. L. SPEROS, M.D., University of North Carolina at Chapel Hill, 1976

J. TAIT, M.B.-B.S., University of Newcastle, England, 1973

R. K. THACKER, M.D., University of Florida, 1973

S. R. TIPTON, M.D., University of Tennessee, 1968

W. R. TUCKER, M.D., University of North Carolina at Chapel Hill, 1974

M. J. TYLER, M.D., Temple University, 1979

A. H. VEAZEY, Jr., M.D., University of Pennsylvania, 1951

J. M. WARREN, M.D., University of Virginia, 1956

S. E. WEISSMAN, B.S., Johns Hopkins University, 1975

G. K. WHITAKER, M.D., Medical University of South Carolina, 1978

T. R. WHITE, M.D., Duke University, 1980

C. V. B. WILSON, M.D., University of Virginia, 1977

P. L. WITT, Cert. Physical Therapy, New York University, 1976

A. WOODARD, M.D., University of Southern California, 1974

W. B. WRAY, Jr., M.D., University of Florida, 1974

## ADJUNCT ASSISTANT PROFESSORS

G. D. ANASTASIO, Pharm.D., Medical University of South Carolina, 1981

T. A. LEE, Ph.D., University of Arizona, 1966

J. M. LINCOURT, Ph.D., State University of New York, 1972

S. C. PIERSON, MSPH, University of Missouri, 1976

S. G. SCOTT, M.A., Duke University, 1981

## ADJUNCT INSTRUCTORS

P. B. HORTON, B.S., East Carolina University, 1972

J. K. MOHNKERN, M.P.H., University of North Carolina at Chapel Hill, 1982

L. A. ROTHENBERGER, M.A., University of North Carolina at Greensboro, 1980

## RESEARCH ASSISTANT PROFESSORS

P. R. GILCHRIST, Ph.D., University of North Carolina at Chapel Hill, 1978

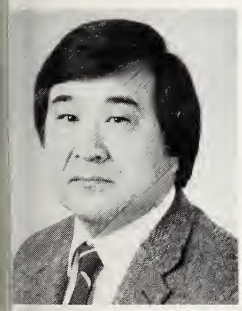
W. H. HAAS III, Ph.D., University of Florida, 1980

# *The Department of Medical Allied Health Professions*

The Department of Medical Allied Health Professions has administrative responsibility for a variety of allied health professions. Currently, master's degree programs are offered in Occupational Therapy, Physical Therapy, Rehabilitation Counseling and Speech and Hearing Sciences. Baccalaureate degree programs include Medical Technology, Physical Therapy and Radiologic Science. Certificate programs include Cytotechnology, Radiation Therapy, Nuclear Medicine and Diagnostic Medical Sonography.

The mission of the department is to provide the State and region with outstanding graduates who are prepared to assume leadership roles in teaching, clinical service and scholarship. Students admitted to the respective programs are expected to show evidence of strong academic performance in prerequisite course work.

*For application procedure contact your program of choice through Department of Medical Allied Health Professions, School of Medicine, Wing E 222H, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27514. Enrollment in undergraduate programs requires acceptance by undergraduate admissions and enrollment in graduate programs requires acceptance by the graduate school.*



## ROFESSOR

. SAKATA (Chair), Ph.D., Kent State Univer-ty, 1970

## SSOCIATE PROFESSOR

G. ENNIS, (Emeritus), Ph.D., University of orth Carolina at Chapel Hill, 1964 (Retired De-mber 1982)

## IRECTOR, ALLIED HEALTH AND CON-INUING EDUCATION AND AHEC

HOWES, M.S., Eastern Michigan University, 71

K. M. McDONALD, M.S., University of Tennessee, 1975

## ADJUNCT ASSISTANT PROFESSORS

J. BIERMA, M.A., University of Michigan, 1974

A. GUTHRIE, B.S., Midwestern University, 1972

S. KEYS, M.Ed., University of Virginia, 1975

L. PARKER, M.Ed., North Carolina State University, 1977

K. SIMPSON, B.S., University of Copenhagen, 1968

G. STEINKRAUS, Ph.D., University of New Hampshire, 1976

L. TILYARD, M.Ed., University of North Carolina at Greensboro, 1980

### CLINICAL ASSOCIATE PROFESSORS

W. W. HILL, M.S.W., Rutgers, 1958

E. GOOLSBY, M.S.W., University of North Carolina at Chapel Hill, 1963

### CLINICAL ASSISTANT PROFESSORS

J. HARNED, M.S.W., University of North Carolina at Chapel Hill, 1963

B. V. MINTON, M.S.W. University of North Carolina at Chapel Hill, 1966

R. E. WEST, M.S., Pennsylvania State University 1970

### CLINICAL INSTRUCTOR

M. S. REED, M.Ed., University of North Carolina at Chapel Hill, 1972

### RESEARCH ASSISTANT PROFESSOR

H. L. COOK, Ph.D., University of North Carolina at Chapel Hill, 1983

## *The Cytotechnology Program*

This accredited certificate program is offered jointly by the Department of Medical Allied Health Professions, Department of Pathology and North Carolina Memorial Hospital. Completion of the program qualifies the graduate to take the national examination for certification as a cytotechnologist. Cytotechnologists are trained technical specialists in early cancer detection.

Prerequisites to admission are a minimum of two years (60 semester hours) of successfully completed course work at an accredited college, which must include at least 14 semester hours of biological sciences. Anatomy, physiology and/or histology, cell biology, embryology, zoology and general chemistry are strongly recommended. Adequate visual acuity for microscopic work is essential.

Training includes microscopy, anatomy, physiology, and cytotechnology of those portions of the human body in which cancer and related diseases can be detected by the cytological method, preparation of specimens, microscopic identification and diagnostic interpretation of findings.

Admission procedures and course descriptions are available by writing Mrs. Sandra Renwick, Cytotechnology Program, Department of Medical Allied Health Professions, School of Medicine, Wing E 222H, University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27514.

### MEDICAL DIRECTOR

R. W. SHERMER, M.D., University of North Carolina at Chapel Hill, 1963

### PROGRAM DIRECTOR

S. M. RENWICK, B.S., Johnson C. Smith University, 1957

## *The Division of Medical Technology*

In order to meet the medical and hospital needs in North Carolina and in order to provide a quality education in medical technology for young men and women of the State, the School of Medicine of The University of North Carolina at Chapel Hill offers, with the cooperation of the Department of Laboratories of the North Carolina Memorial Hospital, a program in Medical Technology leading to a baccalaureate degree.

The major in Medical Technology is designed to be completed in four calendar years. The curriculum consists of two years in General College at the University of North Carolina in Chapel Hill (or its equivalent elsewhere) and two years in the School of Medicine. Upon successful completion, the student is awarded the Bachelor of Science in Medical Technology and is eligible to take a national examination to become a certified Medical Technologist.

Prerequisites are listed in the Undergraduate Bulletin of the Record of The University of North Carolina at Chapel Hill.

## ASSOCIATE PROFESSOR & DIRECTOR

H. CRONENBERGER, Ph.D., University of Houston, 1972

## MEDICAL DIRECTOR

D. CHOU, M.D., University of Pittsburgh, 1974

## ASSISTANT PROFESSORS

S. J. BECK, M.S., University of Minnesota, 1980

A. E. HILGER, Ph.D., University of South Carolina, 1974

V. A. LEGRYS, D.A., Catholic University of America, 1982

R. C. STEVENS, M.S., SUNY at Buffalo, 1971

## CLINICAL INSTRUCTORS

L. D. MILKS, B.S., University of North Carolina at Chapel Hill, 1978

J. A. THOMAS, B.S., University of North Carolina at Chapel Hill, 1978

## CURRICULUM

MEDT 51A. CLINICAL BIOCHEMISTRY I (3). Physiological biochemistry with emphasis on related diseases. *3 lecture hours per week. Fall.* Staff.

MEDT 51B. CLINICAL BIOCHEMISTRY II (5). Interrelation of clinical biochemistry and laboratory assays for specific molecules. Principles of clinical laboratory assays. *3 lecture hours and 4 laboratory hours per week. Spring.* Staff.

MEDT 52. HEMATOLOGY/COAGULATION (6). Introduction to the basic principles of hematology. Lecture topics include anemias, diseases of white cells and bleeding disorders. Laboratory includes routine hematology and screening tests for coagulation diseases. *4 lecture hours and 4 laboratory hours per week. Fall.* Stevens.

MEDT 53. IMMUNOLOGY (4). Basic immunology and serology. Laboratory evaluation of cellular and humoral immunity and relation to disease states. *3 lecture hours and 2 laboratory hours per week. Fall.* Cronenberger.

MEDT 55. PARASITOLOGY, URINALYSIS (4). Study of the life cycles and diagnostic characteristics of the parasites that infect man and a self instructional programmed learning experience in urinalysis with laboratory study of pathologic urines. *3 lecture hours and 2 laboratory hours per week. Fall.* Hilger and Beck.

MEDT 59. CLINICAL LABORATORY COMPUTER SCIENCE (3). Design of algorithms for the clinical laboratory. Selection and use of commercial clinical software. BASIC computer language and terminologies. *10 hours lecture per week plus basic laboratory assignments. Summer.* Hilger and Cronenberger.

MEDT 61. CLINICAL MICROBIOLOGY (6). A comprehensive course describing the biology of microorganisms encountered in clinical laboratories. Laboratory ses-

sions provide practical experience in clinical microbiology. *3 lecture hours and 6 laboratory hours per week. Spring.* Hilger.

MEDT 62. IMMUNOHEMATOLOGY (4). Introduction to the blood group serology with emphasis on the major blood group systems, pretransfusion testing and antibody identification. *2 lectures and 4 laboratory hours per week. Spring.* Beck.

MEDT 63. MANAGEMENT AND EDUCATION (2). Introduction to the basic principles of management and education with an emphasis on the role of the medical technologist in laboratory administration and education. *2 lecture hours per week. Spring.* Cronenberger and Stevens.

MEDT 64. CLINICAL LABORATORY INSTRUMENTATION (3). Basic electronics and application to clinical laboratory instrumentation. Requirements and techniques for interfacing computers with laboratory instrumentation. *10 hours lecture per week plus laboratory assignments. Summer.* Chou.

MEDT 70. CLINICAL LABORATORY PRACTICUM (6). 8 week clinical rotation in a small community hospital laboratory in the state of North Carolina. 40 hours internship per week. Summer. Beck and Stevens.

MEDT 71. CLINICAL CHEMISTRY PRACTICUM (8). Hospital laboratory internship in clinical chemistry. *Fall and Spring.* Stevens.

MEDT 82. CLINICAL HEMATOLOGY PRACTICUM (4). Hospital laboratory internship in clinical hematology. *Fall and Spring.* Stevens.

MEDT 83A. SURVEY OF PATHOLOGY (1). Introduction to pathology emphasizing relationship to clinical laboratory medicine. *Fall and Spring.* McLendon.

MEDT 83B. SURVEY OF PATHOLOGY (1). Continuation of MEDT 83A. *Fall and Spring.* McLendon.

MEDT 84. CLINICAL MICROBIOLOGY PRACTICUM (84). Hospital laboratory internship in clinical microorganisms. *Fall and Spring.* Hilger.

MEDT 85. CLINICAL IMMUNOHEMATOLOGY PRACTICUM (2). Hospital laboratory internship in clinical immunohematology. *Fall and Spring.* Beck.

MEDT 86. CLINICAL IMMUNOLOGY PRACTICUM (1). Hospital laboratory internship in clinical immunology. *Fall and Spring.* Cronenberger.

MEDT 88. CLINICAL COAGULATION PRACTICUM (1). Hospital laboratory internship in clinical coagulation. *Fall and Spring.* Stevens.

MEDT 89. CLINICAL URINALYSIS PRACTICUM (1). Hospital laboratory internship in clinical urinalysis. *Fall and Spring.* Beck.

MEDT 91A. CLINICAL CORRELATIONS I (4). Review of principles and concepts of clinical laboratory science. Application to clinical cases. Areas covered: immunohematology, microbiology, virology, parasitology, mycology, and clinical chemistry. *4 lecture hours per week. Fall.* Beck, Hilger, Staff.

## *The Division of Occupational Therapy*

The Division of Occupational Therapy offers a program leading to the Master of Science degree. Courses with emphasis on physical, psychosocial and developmental disabilities are offered. Students will be prepared for practice, leadership, consultancy, program planning, and research in hospital, community and institutional settings. Students with baccalaureate degrees in fields other than occupational therapy are eligible to apply.

Prerequisites and course descriptions are listed in The Graduate School, Record of The University of North Carolina at Chapel Hill.

### PROFESSOR & DIRECTOR

M. M. MITCHELL, Ph.D., University of North Carolina at Chapel Hill, 1968

### ASSOCIATE PROFESSOR

. C. ROGERS, Ph.D., University of Illinois, 1975

### ASSISTANT PROFESSOR

A. B. BLAKENEY, M.S.OT., Boston University, 974

### CLINICAL ASSISTANT PROFESSOR

L. KING-THOMAS, M.H.S., University of Florida, 1977

### ADJUNCT INSTRUCTOR

J. ROURK, B.S., University of Pennsylvania, 1960

## *The Division of Physical Therapy*

Physical Therapy is one of the health professions participating in the comprehensive approach o patient service, providing services related to patient assessment, treatment, and education in aried settings including acute care hospital, rehabilitation center, childrens' centers, private ractice, and others. To meet the increasing demand for physical therapists in North Carolina nd the Southeast, two educational programs are offered. The undergraduate level is designed to rovide basic preparation for entry into the field and the graduate program is designed for physial therapists wishing to gain advanced information in specialty areas.

Undergraduate prerequisite information is available in the Undergraduate Bulletin of the Recrd of The University of North Carolina at Chapel Hill and course descriptions are available rom the Division of Physical Therapy.

Graduate prerequisite and course descriptions are available in The Graduate School, Record f The University of North Carolina at Chapel Hill.

### SSOCIATE PROFESSOR & DIRECTOR

. P. SCHUCH, M.S., University of Pennsylvaia, 1952

### ROFESSORS

U. MITCHELL, Ph.D., Case Western Reserve niversity, 1970

M. C. SINGLETON, Ph.D., Duke University, 1964

### ASSOCIATE PROFESSORS

S. K. CAMPBELL, Ph.D., University of Wisconsin, 1973

B. R. HOWES, M.S., Eastern Michigan University, 1971

M. W. JOHNSON, M.A., Stanford University, 1964

B. F. LEVEAU, Ph.D., State University of Pennsylvania, 1973

C. M. NELSON, M.A., Duke University, 1964

### ASSISTANT PROFESSORS

S. ATTERMEIER, MACT, University of North Carolina at Chapel Hill, 1977

J. L. MACKINNON, M.P.T., Baylor University, 1974

C. A. PARR, M.S., Boston University, 1969

P. WITT, M.S., University of Massachusetts, 1974

### CLINICAL ASSISTANT PROFESSORS

J. R. SENTER, M.S., Case Western Reserve University, 1971

D. S. SLATON, M.S., University of North Carolina at Chapel Hill, 1982

### VISITING INSTRUCTOR

D. MILLER, B.A., Stockton State College, 1974

### RESEARCH ASSISTANT PROFESSOR

I. J. WILHELM, M.S., Boston University, 1968

### ADJUNCT ASSISTANT PROFESSORS

B. BULEY, MACT, University of North Carolina at Chapel Hill, 1979

D. LINDSEY, MPH, University of North Carolina at Chapel Hill, 1975

S. MCLAURIN, M.Ed., North Carolina Central University, 1974

### ADJUNCT INSTRUCTORS

A. JAMERSON, B.S., University of North Carolina at Greensboro, 1959

B. SKINNER, M.S., Duke University, 1977

## *The Division of Radiologic Science*

The School of Medicine in conjunction with the General College offers the baccalaureate degree in Radiologic Science designed to prepare men and women for professional practice and associated responsibilities in the health specialty of radiologic technology. The program is accredited by the American Medical Association's Committee on Allied Health Accreditation and Education and graduates are eligible for registration by the American Registry of Radiologic Technologists.

Prerequisites and admission procedures are available in The Undergraduate Bulletin of The Record of The University of North Carolina at Chapel Hill. Course descriptions are available from the Division of Radiologic Science.

### DIRECTOR
### ASSOCIATE PROFESSOR

J. C. KEENE, M.S., University of Cincinnati, 1971

### CURRICULUM COORDINATOR & ASSISTANT PROFESSOR

R. L. THORPE, Ed.D., North Carolina State University, 1981

### INSTRUCTORS

C. B. BURNS, M.S., University of North Carolina at Chapel Hill, 1982

G. W. TURNER, M.S., North Carolina Central University, 1979

### CLINICAL EDUCATION COORDINATOR/INSTRUCTOR

K. D. JONES, B.S., University of North Carolina at Chapel Hill, 1981.

## *The Nuclear Medicine Technology Program*

A 12-month program in Nuclear Medicine Technology is conducted by the faculty and staff of the Imaging Division, Radiology Department, North Carolina Memorial Hospital and the School of Medicine of The University of North Carolina. The program is fully accredited by the American Medical Association's Committee on Allied Health Accreditation and Education. Graduates of the program are awarded the Certificate in Nuclear Medicine Technology by The University of North Carolina and are eligible for national certification by the American Registry of Radiologic Technologists, the American Society of Clinical Pathologists, and the Nuclear Medicine Technology Certification Board, Inc. in Nuclear Medicine Technology.

Classes begin in August of each year and applications must be submitted by the preceding March 15th. Applicants eligible for consideration must be certified as a radiologic technologist (ARRT), a medical technologist (ASCP), or be a college graduate with a Bachelor of Science degree, with a major in biological or health science.

Application forms and other materials may be obtained from the Director, Division of Radiologic Science, Department of Medical Allied Health Professions, School of Medicine, Wing E 222H, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27514.

### PROGRAM DIRECTOR

M. PARRISH, C.M.T., North Carolina Memorial Hospital, 1968

### MEDICAL DIRECTOR

W. MCCARTNEY, M.D., Northwestern University, 1969

### DIDACTIC STAFF

R. E. JOHNSTON, Ph.D., Vanderbilt University, 1968

J. R. PERRY, M.D., University of Tennessee, 1967

R. KOWALSKY, Pharm.D., University of Kentucky, 1972

E. STAAB, M.D., University of Minnesota, 1961

## *The Radiation Therapy Technology Program*

The program in Radiation Therapy Technology is conducted by the faculty and staff of the Division of Radiation Therapy, The University of North Carolina School of Medicine and North Carolina Memorial Hospital. The program is approved by the American Medical Association's Committee on Allied Health Accreditation and Education. Graduates are eligible for the certification examination in Radiation Therapy as administered by The American Registry of Radiologic Technologists.

This one-year program beginning in August consists of both extensive didactic and clinical education on a wide spectrum of therapy equipment: 20 MV Linear Accelerator with electron beam, 4 MV Linear Accelerator, Theratron-80 Cobalt 60 Unit, ample supply of Brachytherapy sources, therapy simulator, and an expanding computer dosimetry program.

Applications will be considered from individuals who are certified as Radiographers by the American Registry of Radiologic Technologists. Applications must be complete by February 1 of the year of desired entrance into the program.

Application forms and other materials may be obtained from the Director, Radiation Therapy Technology Program, Division of Radiation Therapy, Department of Radiology, N.C. Memorial Hospital, Chapel Hill, North Carolina 27514.

### PROGRAM DIRECTOR

L. STANLEY, R.T.T., Greensboro College, 1976

### EDUCATIONAL COORDINATOR

D. SMITH, R.T.T., North Carolina Memorial Hospital, 1980

### DIDACTIC STAFF

E. CHANEY, Ph.D., University of Tennessee, 1969

R. E. JOHNSTON, Ph.D., Vanderbilt University, 1968

J. NAVES, R.T.T., North Carolina Memorial Hospital, 1975

## *The Diagnostic Medical Sonography Program*

The School of Medicine and the North Carolina Memorial Hospital through the Division of Imaging, Department of Radiology, sponsors a twelve-month program in Diagnostic Medical Sonography. Graduates are awarded a certificate in Diagnostic Medical Sonography by the School of Medicine and the North Carolina Memorial Hospital and are eligible for national certification by the American Registry of Diagnostic Medical Sonographers.

The general curriculum includes physics, instrumentation, anatomy, physiology, and didactic and clinical instruction in abdominal, obstetrical, pelvic, neck, extremities and other applications.

Applicants eligible for admission consideration must qualify in one of the two following categories:

1. Registered radiologic technologist (ARRT) or a graduate eligible for certification by the American Registry of Radiologic Technologists.
2. Registered nuclear medicine technologist (ARRT or NMTCB) or eligible for certification by the American Registry of Radiologic Technologists or the nuclear medicine technology certification board.

Application forms are available on request from the Director, Division of Radiologic Science, Department of Medical Allied Health Professions, School of Medicine, Wing E 222H, The University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27514.

Completed applications for August admission must be postmarked no later than March 15 of the year of intended enrollment. Only one class is admitted per year beginning with the fall semester.

### MEDICAL DIRECTOR

C. MITTELSTAEDT, M.D., University of Arkansas, 1971

### EDUCATIONAL COORDINATOR

E. DANIEL, R.D.M.S., North Carolina Memorial Hospital, 1977

## *The Division of Rehabilitation Counseling*

This is a four-semester master's degree professional program in Rehabilitation Counseling. The program is interdisciplinary in nature and is developed to meet each student's individual needs, with theory and practice integrated throughout the four semester program. Background work in the social sciences, the behavioral sciences, and allied health areas is recommended.

The primary objective of this program is to educate rehabilitation counselors to become practicing professionals working in medical and psychiatric rehabilitation facilities, State-Federal rehabilitation programs, private industry, and other related areas of employment.

Prerequisites and course descriptions are available in The Graduate School, Record of The University of North Carolina at Chapel Hill.

### ASSOCIATE PROFESSOR & DIRECTOR

P. LEUNG, Ph.D., Arizona State University, 1970

### PROFESSOR

R. SAKATA, Ph.D., Kent State University, 1970

### ASSISTANT PROFESSOR

C. L. WILHELM, Ph.D., Indiana State University, 1976

## *The Division of Speech and Hearing Sciences*

The Division of Speech and Hearing Sciences in the Department of Medical Allied Health Professions, School of Medicine provides academic and professional training for speech and language pathologists and audiologists at the master's degree level. The study of speech and hearing concerns knowledge and practices pertaining to both normal and abnormal speech, hearing and language: The Speech and Hearing Curriculum provides an environment where learning can be based on both clinical and experimental laboratory experiences. Two major tracks of study are possible within the master's curriculum; Audiology and Speech and Language Pathology. The program is interdisciplinary in that personnel and clinical and research activities of other University departments and institutions as well as the Division of Speech and Hearing Sciences are involved in the educational program.

Prerequisites and course descriptions are available in The Graduate School, Record of The University of North Carolina at Chapel Hill. More detailed prerequisite information is available from the Division of Speech and Hearing Sciences.

### ASSOCIATE PROFESSOR & DIRECTOR

R. B. MAHAFFEY, Ph.D., Ohio State University, 1966

### PROFESSOR

R. W. PETERS, Ph.D., Ohio State University, 1953

### ASSOCIATE PROFESSOR

T. L. LAYTON, Ph.D., University of Nebraska-Lincoln, 1976

### ASSISTANT PROFESSORS

R. JAY, Ph.D., Vanderbilt University, 1977

P. PORTER, Ph.D., University of North Carolina at Chapel Hill, 1980.

## CLINICAL ASSOCIATE PROFESSORS

S. HADJIAN, Ph.D., SUNY, Buffalo, 1972

R. DALSTON, Ph.D., Northwestern University, 1972

F. C. KNOBELOCH, Ph.D., University of Florida, 1959

W. G. THOMAS, Ph.D., University of Florida, 1968

## CLINICAL INSTRUCTORS

E. DALSTON, M.A., Northwestern University, 1965

H. HARRIS, M.S., University of North Carolina at Chapel Hill, 1973

M. HARRISON, M.Ed., Boston University, 1973

M. J. NOMEIR, M.S., University of North Carolina at Chapel Hill, 1976

S. RINGWALT, M.S., Vanderbilt University, 1976

J. C. THRESHER, M.A., University of Massachusetts, 1979.

L. WATERS, M.A., Michigan State University, 1977

## ADJUNCT ASSOCIATE PROFESSORS

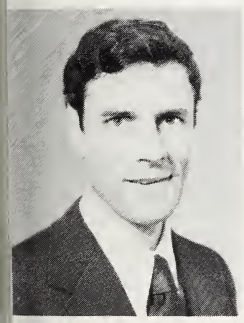
S. J. MARTINKOSKY, Ph.D., Ohio State University, 1975

R. B. PAUL, Ph.D., University of Oklahoma, 1969

## ADJUNCT INSTRUCTOR

S. DEWAR, M.S., University of North Carolina at Greensboro, 1976

# *The Department of Medicine*



The Department of Medicine has primary responsibilities for teaching medical students, residents and post-doctoral fellows in the clinical area of internal medicine. These teaching activities take place in the outpatient clinics and on the inpatient services of the North Carolina Memorial Hospital, and at affiliated hospitals in Charlotte, Wilmington, Raleigh, Greensboro and Asheville. In addition to basic education in primary care internal medicine, the department offers electives or post-doctoral training programs in a number of internal medicine subspecialties, including cardiology, clinical epidemiology, digestive diseases and nutrition, endocrinology and metabolism, hematology, infectious diseases, medical genetics, nephrology, oncology, pulmonary diseases and rheumatology. Care of patients with a wide variety of problems within the field of internal medicine is an essential part of the department's training activities. Expert medical care by members of the department is also an important service to the people of North Carolina. Original clinical or biomedical research is conducted by most faculty members, with opportunities for participation by students or post-doctoral trainees at all levels.

## PROFESSORS

). A. ONTJES (Chair) (Eunice Bernhard Distinguished Professor of Medicine and Pharmacology), M.D., Harvard University, 1964

. B. BARNETT (Bonner Professor of Medicine), M.D., University of Rochester, 1949

M. C. BATTIGELLI, M.D., University of Florence, 1951

. BECK, M.D., University of Colorado, 1961

V. B. BLYTHE, M.D., Washington University, 953

. BONDURANT (Dean), M.D., Duke University, 1953

. M. BOZYMSKI, M.D., Marquette University, 960

. A. BRIGGAMAN, M.D., New York University, 1960

P. A. BROMBERG, M.D., Harvard University, 1953

J. A. BRYAN, II, M.D., University of Pennsylvania, 1957

Y. C. CHENG, Ph.D., Brown University, 1972

R. E. COLINDRES, M.D., University of El Salvador, 1966

E. CRAIGE (Henry A. Foscue Distinguished Professor of Medicine), M.D., Harvard University, 1943

W. J. CROMARTIE (Alumni Distinguished Professor of Microbiology and Immunology and Medicine), M.D., Emory University, 1937

H. E. DASCOMB, M.D., University of Rochester, 1943

G. H. DEFRIESE, Ph.D., University of Kentucky, 1967

F. L. ELDRIDGE, M.D., Stanford University, 1948

T. W. FARMER, M.D., Harvard University, 1941

A. L. FINN, M.D., Boston University, 1958

J. J. FISCHER (Sarah Graham Kenan Professor of Medicine), M.D., Johns Hopkins University, 1948

W. L. FLEMING (Emeritus), M.D., Vanderbilt University, 1932

R. H. FLETCHER, M.D., Harvard University, 1966

S. W. FLETCHER (Vice Chairman), M.D., Harvard University, 1966

C. C. FORDHAM III (Chancellor), M.D., Harvard University, 1951

L. S. GETTES, M.D., University of Pennsylvania, 1958

H. J. GITELMAN, M.D., University of Rochester, 1958

C. W. GOTTSCHALK (Kenan Professor of Medicine and Physiology), M.D., University of Virginia, 1945

T. K. GRAY, M.D., University of Maryland, 1965

J. W. GRISHAM, M.D., Vanderbilt University, 1957

C. D. HALL, M.B.Ch.B., Aberdeen University, Scotland, 1966

J. N. HAYWARD, M.D., Tufts University, 1954

W. D. HEIZER, M.D., Johns Hopkins University, 1963

J. C. HERION, M.D., Harvard University, 1953

W. B. HERRING, M.D., Wake Forest University, 1953

W. E. LASSITER, M.D., Harvard University, 1954

C. B. LYLE, Jr., M.D., Columbia University, 1957

W. D. MATTERN (Vice Chairman), M.D., Columbia University, 1965

E. S. MAYER, M.D., Columbia University, 1964

J. S. PAGANO, M.D., Yale University, 1957

J. G. PALMER, M.D., Emory University, 1944

J. C. PARKER, M.D., Yale University, 1961

D. W. POWELL, M.D., Medical College of Alabama, 1963

D. D. RAFT, M.D., University of Nebraska, 1958

H. R. ROBERTS, M.D., University of North Carolina at Chapel Hill, 1955

J. T. SESSIONS, Jr., M.D., Emory University, 1945

J. M. SORROW, Jr., M.D., University of Pennsylvania, 1946

P. F. SPARLING, M.D., Harvard University, 1962

M. R. SWIFT, M.D., New York University, 1962

R. D. UTIGER, M.D., Washington University, 1957

R. I. WALKER, M.D., Harvard University, 1954

E. E. WERK, Jr., M.D. University of Cincinnati 1946

C. E. WHEELER, Jr., M.D., University of Wisconsin, 1941

J. B. WINFIELD, M.D., Cornell University, 1968

J. W. WOODS, M.D., Vanderbilt University, 1943

D. T. YOUNG, M.D., Harvard University, 1950

W. J. YOUNT, M.D., University of Wisconsin 1960

## ASSOCIATE PROFESSORS

B. B. BOEHLECKE, M.D., State University o New York at Buffalo, 1970

R. C. BOUCHER, Jr., M.D., Columbia Univer sity, 1970

P. L. COHEN, M.D., Yale University, 1972

R. E. CROSS, Ph.D., University of Florida, 197

L. X. CUBEDDU, M.D., Central University, Ver ezuela, 1964; Ph.D., University of Colorado, 197

D. L. DOLAN, M.D., Vanderbilt University, 195

J. F. DONOHUE, M.D., College of Medicine an Dentistry of New Jersey, 1969

D. A. DROSSMAN, M.D., Albert Einstein Co lege of Medicine, 1970

H. S. EARP, M.D., University of North Carolin at Chapel Hill, 1970

A. L. EHLE, M.D., University of Washingtor 1967

R. A. EISENBERG, M.D., Stanford University 1971

W. F. FINN, M.D., State University of New Yor at Syracuse, 1966

J. R. FOSTER, M.D., Cornell University, 1969

M. FRIEDMAN, M.D., University of Miami, 196

D. A. GABRIEL, M.D., Ph.D., University North Carolina at Chapel Hill, 1972, 1979

W. R. GAMMON, M.D., University of Nort Carolina at Chapel Hill, 1971

R. S. GREENWOOD, M.D., University of Texas Medical Branch at Galveston, 1968

M. A. GREGANTI, M.D., University of Mississippi, 1972

T. R. GRIGGS, M.D., University of North Carolina at Chapel Hill, 1969

J. T. GWYNNE, M.D., Duke University, 1970

N. M. HADLER, M.D., Harvard University, 1968

J. E. HAMMOND, Ph.D., University of Florida, 1974

A. J. HOOLE, M.D., Medical College of South Carolina, 1964

E. S. HUANG, Ph.D., University of North Carolina at Chapel Hill, 1971

E. W. JENSEN, M.D., Case Western Reserve University, 1969

J. S. KIZER, M.D., Duke University, 1970

S. M. LEMON, M.D., University of Rochester, 1972

H. R. LESESNE, M.D., Vanderbilt University, 1967

J. D. MANN, M.D., Cornell University, 1969

J. D. MCCUE, M.D., Case Western Reserve University, 1969

C. T. NUZUM, M.D., Harvard University, 1964

R. C. ORLANDO, M.D., Georgetown University, 1968

E. P. ORRINGER, M.D., University of Pittsburgh, 1969

C. G. PICKARD, Jr., M.D., University of North Carolina at Chapel Hill, 1962

K. A. POPIO, M.D., Columbia University, 1966

S. M. PUTNAM, M.D., Harvard University, 1964

J. F. ROGERS, M.D., University of Maryland, 1967

D. W. ROSS, Ph.D., University of California at San Francisco, 1972; M.D., University of California at Berkeley, 1974

G. D. ROSS, Ph.D., University of Miami, 1971

D. S. SHEPS, M.D., University of North Carolina at Chapel Hill, 1969

R. J. SIMPSON, M.D., Georgetown University, 1973

P. C. UNGARO, M.D., University of Miami, 1968

G. C. WHITE II, M.D., University of North Carolina at Chapel Hill, 1971

W. B. WOOD, M.D., University of North Carolina at Chapel Hill, 1956

## ASSISTANT PROFESSORS

D. R. CLEMMONS, M.D., University of North Carolina at Chapel Hill, 1974

M. S. COHEN, M.D., Rush Medical College, 1974

R. A. DAVIDSON, M.D., Vanderbilt University, 1972

D. L. EVANS, M.D., Temple University, 1976

R. J. FALK, M.D., University of North Carolina at Chapel Hill, 1977

J. J. GONZALEZ, M.D., University of Chile, 1971

A. K. HALPERIN, M.D., University of Kansas, 1971

J. F. HOWARD, Jr., M.D., University of Vermont, 1974

M. R. KNOWLES, M.D., University of North Carolina at Chapel Hill, 1971

T. W. LANE, M.D., Cornell University, 1971

J. A. MESSENHEIMER, M.D., Johns Hopkins University, 1970

V. RANGA, M.B.B.S., All India Institute of Medical Sciences, 1971

S. M. RETCHIN, M.D., University of North Carolina at Chapel Hill, 1976

C. S. ROGERS, M.D., University of North Carolina at Chapel Hill, 1973

R. S. SANDLER, M.D., Yale University, 1975

R. B. SARTOR, M.D., Baylor College of Medicine, 1974

S. V. SAUTER, M.D., University of North Carolina at Chapel Hill, 1974

D. S. SISCOVICK, M.D., University of Maryland, 1976

S. L. WARREN, M.D., Medical College of Virginia, 1949

P. W. WILLIS IV, M.D., University of Michigan, 1975

## INSTRUCTORS

L. R. BERKOWITZ, M.D., Ohio State University, 1975

M. DANIS, M.D., University of Chicago, 1975

J. NONEMAN, M.D., University of North Carolina at Chapel Hill, 1977

## RESEARCH ASSOCIATE PROFESSORS

M. J. HAZUCHA, M.D., Comenius University, 1962; Ph.D., McGill University, 1973

## RESEARCH ASSISTANT PROFESSORS

J. W. BUCHANAN, Jr., M.D., University of Kentucky, 1975

F. M. GRIFFIN, Ph.D., Ohio State University, 1966

M. J. GRIFFITH, Ph.D., University of Texas, 1977

G. E. LESTER, Ph.D., Medical College of Virginia, 1977

S. NEWMAN, Ph.D., University of Alabama, 1978

W. A. RUTALA, Ph.D., University of North Carolina at Chapel Hill, 1979

D. S. SAUNDERS, Ph.D., University of North Carolina at Chapel Hill, 1982

D. L. STRAIGHT, Ph.D., University of North Carolina at Chapel Hill, 1979

M. J. STUTTS, Ph.D., University of North Carolina at Chapel Hill, 1978

## CLINICAL PROFESSORS

F. H. ALLEN, Jr., M.D., Columbia University, 1959; R. M. BOERNER, M.D., University of North Carolina at Chapel Hill, 1961; E. L. BRYAN, M.D., University of Pennsylvania, 1961; J. R. CHAMBLISS, M.D., Harvard University, 1944; D. S. CITRON, M.D., Washington University, 1944; C. D. FARMER, M.D., Indiana University, 1958; R. L. FENNING, M.D., University of Vermont, 1964; A. R. FRAZIER, M.D., University of Kentucky, 1969; N. H. GARRETT, Jr., M.D., Duke University, 1950; H. L. GODWIN, M.D., Harvard University, 1947; H. A. GODWIN, Jr., M.D., Wake Forest University, 1963; N. B. HARBOLD, M.D., George Washington University, 1966; R. A. HARE, M.D., Wake Forest University, 1945; J. B. HOBSON, M.D., University of North Carolina at Chapel Hill, 1957; G. V. IRONS, Jr., M.D., University of Alabama, 1956; J. K. JONES, M.D., Duke University, 1946; S. B. JOYNER, M.D., University of North Carolina at Chapel Hill, 1955; W. S. JOYNER, M.D., Harvard University, 1952; L. W. KELLY, M.D., Harvard University, 1948; O. C. KIMBRELL, Jr., M.D., University of Pennsylvania, 1951; E. E. LANDIS, M.D., University of Louisville, 1962; J. A. LUSK III, M.D., Medical College of Alabama, 1951; E. T. MARSHBURN, Jr., M.D., Wake Forest University, 1947; M. M. MCCALL III, M.D., University of North Carolina at Chapel Hill, 1956; T. H. MCMILLAN, Jr., M.D., Emory University, 1953; C. R. MERWARTH, M.D., Duke University, 1955; P. R. O'BAR, M.D., University of Oklahoma, 1957; E. B. PAGE, Jr., M.D., Duke University, 1949; R. B. PAYNE, M.D., University of North Carolina at Chapel Hill, 1960; L. J. RABOLD, M.D., Vanderbilt University, 1941; E. A. RASBERRY, Jr., M.D., University of Pennsylvania, 1941; C. R. RUPPENTHAL, Jr., M.D., University of Pennsylvania, 1960; J. H. RUSSELL, M.D., University of Virginia, 1964; P. F. SHELBURNE, M.D., University of North Carolina at Chapel Hill, 1955; W. C. SUGG, Jr., M.D., Emory University, 1961; A. J. TANNENBAUM, M.D., St. Leo's Hospital, 1935; B. VATZ, M.D., Duke University, 1945; H. S. WAINER, M.D., Wake Forest University, 1954; S. E. WARSHAUER, M.D., Medical College of Virginia, 1936; K. D. WEEKS, M.D., Duke University, 1939; R. W. WILLETT, M.D., Duke University, 1948.

## CLINICAL PROFESSORS EMERITUS

J. M. ALEXANDER, M.D.C.M., McGill University, 1934; M. D. BONNER, M.D., University of North Carolina and Maryland, 1930; V. S. CAVINESS, M.D., Jefferson Medical College, 1921; S. F. LEBAUER, M.D., University of Virginia, 1929; F. G. PATTERSON, M.D., University of Pennsylvania, 1937 (deceased 1984); N. G. PRITCHETT, D.C.M., Dalhousie University, Canada, 1942; P. A. SHELBURNE, M.D., Medical College of Virginia, 1927; O. N. SMITH, M.D., University of Pennsylvania, 1933; J. B. STEVENS, M.D., Duke University, 1936; R. M. WHEELER, M.D., Washington University, 1943.

## ADJUNCT PROFESSORS

P. CUATRECASAS, M.D., Washington University, 1962; A. GELLHORN, M.D., Washington University, 1937; M. E. WALL, Ph.D., Rutgers University, 1939.

## CLINICAL ASSOCIATE PROFESSORS

J. F. ALEXANDER, M.D., McGill University, 1963; R. D. ALMKUIST II, M.D., Wake Forest University, 1971; A. A. ANSARI, Ph.D., Aligarh Muslim University, India, 1971; J. W. BAKER, M.D., University of Virginia, 1971; W. E. BELLAMY, Jr., M.D., Wake Forest University, 1947; W. T. BENNETT, M.D., Tulane University, 1965; R. H. BILBRO, M.D., University of North Carolina at Chapel Hill, 1966; J. H. BLACK, M.D., Wake Forest University, 1963; G. W. BLAIR, Jr., M.D., University of Pennsylvania, 1947; G. W. BLAKE, M.D., University of North Carolina at Chapel Hill, 1967; W. F. BOBZEIN, M.D., Georgetown University, 1969; T. A. BRACKBILL, M.D., Columbia University, 1968; B. R. BRODIE, M.D., Washington University, 1970; J. I. BROOKS, Jr., M.D., University of North Carolina at Chapel Hill, 1958; J. C. BRUCE, M.D., George Washington University, 1951; R. M. BUIE, Jr., M.D., Wake Forest University, 1944; W. R. BULLOCK, M.D., University of Tennessee, 1968; R. R. CALDWELL, M.D., Wake Forest University, 1975; T. F. CAMP, M.D., Emory University, 1962; B. R. CANADAY, Ph.D., University of Tennessee, 1973; J. T. CHANDLER, M.D., Medical College of South Carolina, 1963; K. J. CLARK, Jr., M.D., State University of New York at Buffalo, 1971; A. T. COFFEE, Jr., M.D., Emory University, 1944; T. E. COOPER, Jr., M.D., Duke University, 1959; J. D. CRAVEN, M.D., University of North Carolina at Chapel Hill, 1962; W. F. CREDLE, Jr., M.D., Medical College of Virginia, 1967; J. N. DEAN, M.S., Emory University, 1974; T. B. DEERING, M.D., New York Medical College, 1972; J. A. DIAZ-BUXO, M.D., University of Puerto Rico, 1970; W. R. DOMBY, M.D., Medical College of Virginia, 1972; W. M. DUNLAP, M.D., Duke University, 1965; J. W. EAKINS, M.D., Wake Forest University, 1970; M. ELMORE, M.D., University of South Carolina, 1971; C. A. EURE, M.D., University of North Carolina at Chapel Hill, 1967; B. B. FERDON, M.D., Tulane University, 1962; C. R. FERNANDEZ, M.D., Tulane University, 1977; R. L. FOLLMER, M.D., Temple University, 1966; R. E. GADDY, Jr., M.D., Duke University, 1959; R. L. GARBER, M.D., Medical University of South Carolina, 1967; C. C. GEIGER, M.D., Loyola University, 1969; B. W. GILMORE, M.D., University of Pennsylvania, 1956; W. M. GINN, M.D., University of North Carolina at Chapel Hill, 1959; D. GOTTOVI, M.D., University of Rochester, 1965; G. R. GRANT, Jr., M.D., Duke University, 1963; R. L. GREENE, Jr., M.D., University of West Virginia, 1970; C. M. GRIGG, M.D., University of North Carolina at Chapel Hill, 1961; S. S. GUSTKE, M.D., University of West Virginia, 1964; D. G. HALL, M.D., University of Florida, 1965; J. H. HARDISON, M.D., Duke University, 1956; J. R. HARPER, M.D., University of North Carolina at Chapel Hill, 1960; C. W. HARRIS, M.D., University of North Carolina at Chapel Hill, 1960; F. HIESTAND, Jr., M.D., University of Virginia, 1956; D. L. HILL, M.D., University of Southern California, 1966; H. N. HILL, Jr., M.D., Wake Forest University, 1970; H. T. HINSHAW, M.D., University of North Carolina at Chapel Hill, 1966; S. J. JACOBS, M.D., Boston University, 1968; F. S. JOHNSTON, Jr., M.D., University of North Carolina at Chapel Hill, 1959; N. J. KRAMER, M.D., Jefferson Medical College, 1965; T. T. KUNSTLING, M.D., Duke University, 1968; J. E. LAWRENCE, Jr., M.D., Duke University, 1972; E. J. LEBAUER, M.D., Duke University, 1960; J. C. LENTZ, Jr., M.D., Duke University, 1942; P. M. LEVITIN, M.D., University of Pennsylvania, 1969; J. C. MacKAY, M.D., Wake Forest University, 1947; D. M. MacQUEEN, M.D., University of North Carolina at Chapel Hill, 1969; T. V. MASSEY, Jr., M.D., Wake Forest University, 1955; J. W. McBEE, M.D., Baylor University, 1954; J. L. McCAIN, M.D., University of Virginia, 1952; J. H. McCUTCHAN, Jr., M.D., Johns Hopkins University, 1961; D. K. MILLWARD, M.D., George Washington University, 1965; A. M. MOSER, Jr., M.D., University of North Carolina at Chapel Hill, 1974; T. L. MURPHY, M.D., Harvard University, 1943; W. M. S. NESBIT, M.D., University of Virginia, 1962; W. P. NIXON, M.D., Medical College of Virginia, 1968; D. B. OLIN, M.D., Ohio State University, 1968; J. R. O'ROURKE, Jr., M.D., University of Kentucky, 1966; J. A. PAAR, M.D., University of Pittsburgh, 1960; W. C. PIERSON, Jr., M.D., Duke University, 1966; J. W. PLONK, M.D., Duke University, 1968; W. G. PORTER, M.D., Medical College of South Carolina, 1963; W. I. PROCTOR, M.D., Duke University, 1957; L. C. RICE, M.D., Emory University, 1970; J. C. RILEY, M.D., Temple University, 1967; N. J. ROBINSON, M.D., Duke University, 1963; R. J. ROSEN, M.D., George Washington University, 1955; W. T. ROWE, M.D., University of North Carolina at Chapel Hill, 1969; J. RUSKIN, M.D., Albert Einstein College of Medicine, 1960; D. J. RUSS, M.D., University of Maryland, 1973; J. K. RUSSELL, M.D., University of Virginia, 1964; C. K. RUST III, M.D., Wake Forest University, 1968; K. V. SACHS, M.D., University of Vienna, 1935; K. W., SALISBURY, M.D., Harvard University, 1968; F. A. SARUBBI, Jr., M.D., New York University, 1969; W. H. SAUNDERS III, M.D., Duke

University, 1967; J. W. SAWYER, M.D., Case Western Reserve University, 1952; R. G. SENTER, M.D., Johns Hopkins University, 1966; R. E. SEVIER, M.D., University of North Carolina at Chapel Hill, 1966; M. B. SHAPIRO, M.D., University of North Carolina at Chapel Hill, 1966; F. A. SHUFORD, M.D., University of North Carolina at Chapel Hill, 1962; W. F. SHUFORD, M.D., University of North Carolina at Chapel Hill, 1961; K. T. SHULTZ, M.D., Duke University, 1965; E. H. SIDES III, M.D., University of North Carolina at Chapel Hill, 1965; D. W. SILLMON, M.D., University of North Carolina at Chapel Hill, 1963; W. J. SIMONS, M.D., University of North Carolina at Chapel Hill, 1972; T. H. SMELZER, M.D., Columbia University, 1962; R. L. SMITH, M.D., Tulane University, 1972; R. E. SMITH, M.D., University of Illinois, 1964; S. W. SMITH, M.D., University of North Carolina at Chapel Hill, 1972; J. W. SNYDER, M.D., University of North Carolina at Chapel Hill, 1969; R. S. SPAIN, M.D., University of Washington, 1946; E. W. STEVENS, M.D., University of North Carolina at Chapel Hill, 1966; A. STEWART, Jr., M.D., University of Washington, 1944; R. H. SVENSON, M.D., University of Chicago, 1969; R. J. TAMISIEA, M.D., Creighton University, 1964; J. A. TAYLOR, M.D., Harvard University, 1943; L. S. THORP, M.D., University of Pennsylvania, 1952; W. V. THRASH, M.D., Medical College of Georgia, 1970; M. F. TOWNSEND, M.D., Wake Forest University, 1961; G. R. TUCKER, Jr., M.D., University of North Carolina at Chapel Hill, 1955; P. C. TUCKER, Jr., M.D., Medical College of Georgia, 1965; N. B. WATTS, M.D., University of North Carolina at Chapel Hill, 1969; Z. WEAVER III, M.D., University of North Carolina at Chapel Hill, 1961; J. L. WHALEY, M.D., Medical College of Virginia, 1948; L. S. WILKINS, M.D., Medical College of Virginia, 1967; E. S. WILLIAMS, M.D., University of North Carolina at Chapel Hill, 1954; D. E. WISE, M.D., Ohio State University, 1969; W. G. WYSOR, Jr., M.D., University of Virginia, 1950; W. B. YOUNG, M.D., Emory University, 1948; J. A. YOUNT, M.D., University of North Carolina at Chapel Hill, 1966.

## CLINICAL ASSOCIATE PROFESSORS EMERITI

J. W. ALLGOOD, M.D., Emory University, 1938; J. R. BUMGARNER, M.D., Medical College of Virginia, 1939; A. D. COOPER, M.D., George Washington University, 1931; C. M. HARRIS, M.D., Wake Forest University, 1947.

## ADJUNCT ASSOCIATE PROFESSORS

L. M. CUTCHIN, M.D., University of North Carolina at Chapel Hill, 1962; E. G. LAPETINA, Ph.D., University of Buenos Aires, Argentina, 1967.

## CLINICAL ASSISTANT PROFESSORS

K. F. ADAMS, M.D., University of North Carolina at Chapel Hill, 1976; W. G. ALLEN, M.D., Wake Forest University, 1976; J. ALVA, M.D., St. Louis University, 1960, M.D., University National De La Plata, Argentina, 1968; A. F. AMICK, M.D., Harvard University, 1956; P. E. ASHBURN, M.D., Wake Forest University, 1974; M. P. BAUCOM, M.D., University of North Carolina at Chapel Hill, 1980; D. I. BECKER, M.D., University of Kentucky, 1972; J. L. BENEDUM, M.D., University of West Virginia, 1973; S. A. BERNARD, M.D., University of North Carolina at Chapel Hill, 1973; W. R. BERRY, M.D., Duke University, 1973; C. S. BETTS, M.D., University of Virginia, 1967; R. F. BIANCHI, M.D., University of Florida, 1973; O. R. BOEHM, M.D., University of Kansas, 1973; J. A. BOICE, M.D., University of Iowa, 1969; E. J. H. BOX, M.D., Wake Forest University, 1973; P. BOX, M.D., University of Florida, 1973; E. A. BRADFORD, M.D., University of Florida, 1976; D. W. BROWN, M.D., University of Rochester, 1967; D. B. CAMPBELL, M.D., University of Alabama at Birmingham, 1971; C. D. CARTER, M.D., University of North Carolina at Chapel Hill, 1971; R. W. CARTER, M.D., Wake Forest University, 1963; G. R. CHEELY, M.D., University of Pennsylvania, 1974; J. K. CHOSKI, M.D., Medical College of Baroda, India, 1972; P. S. CLARK, M.D., New York University, 1973; M. J. CONLEY, Jr., M.D., Duke University, 1973; J. S. COXE III, M.D., University of North Carolina at Chapel Hill, 1971; H. D. CREWS, M.D., Johns Hopkins University, 1964; D. L. CROCKER, M.D., University of North Carolina at Chapel Hill, 1970; C. DALTO, M.D., New York School of Medicine, 1976; J. L. DEWALT, M.D., University of North Carolina at Chapel Hill, 1954; J. D. DIRKERS, M.D., Duke University, 1965; R. P. DOOLITTLE, M.D., University of Alabama, 1974; D. A. DOWDY, M.D., University of Connecticut, 1976; R. T. DOYLE, M.D., Johns Hopkins University, 1954; H. A. EATON, Jr., M.D., Meharry Medical College, 1969; C. M. ELLIOTT, M.D., Medical College of Virginia, 1970; L. D. ELLISTON, Jr., M.D., Baylor University, 1969; M. G. FIORILLI, M.D., Catholic University, 1971; D. G. FREEMAN, Jr., M.D., Duke

Jniversity, 1968; J. E. GARDELLA, M.D., New ork University, 1974; J. N. GHASSEMIAN, 1.D., Teheran University, Iran, 1971; G. A. LAUBIGER, M.D., Ph.D., New York University, 970; M. B. GOLBY, M.D., George Washington niversity, 1953; A. F. GOLEY, M.D., University f North Carolina at Chapel Hill, 1956; W. OUGH III, M.D., University of Rochester, 1976; . A. GRANOVETTER, M.D., Yale University, 974; A. G. GREEN, M.D., Tulane University, 973; E. J. GREEN, M.D., University of Tennes- e, 1974; M. W. GRIER, M.D., Southern Califor- ia Medical School, 1969; S. H. GROSSMAN, I.D., Medical College of Virginia, 1973; D. D. ROVE, Ph.D., M.D., University of Chicago, 969, 1970; J. D. GUPTA, M.D., Delhi Univer- ty, India, 1970; E. D. HAAK, Jr., M.D., Univer- ty of Virginia, 1968; L. J. HAK, Pharm D., hiladelphia College of Pharmacy & Science, 1971; . B. HARDISON, M.D., Northwestern Univer- y, 1954; L. O. HARPER, M.D., University of Vest Virginia, 1967; C. W. HARSHAW, Jr., .D., University of North Carolina at Chapel ill, 1971; T. W. HAUCH, M.D., Northwestern niversity, 1972; D. A. HAYES, M.D., University Virginia, 1972; H. B. HAYWOOD III, M.D., niversity of North Carolina at Chapel Hill, 1972; W. HELAK, M.D., State University of New ork-Upstate Medical Center, 1975; G. C. HE- INGWAY, M.D., University of North Carolina Chapel Hill, 1963; R. A. HEYER, M.D., Univer- y of Texas-Southwestern, 1973; B. J. HOFF- AN, M.D., Emory University, 1976; W. F. OPPER, M.D., University of West Virginia, 72; J. H. HULL, M.S., University of North arolina at Chapel Hill, 1973; J. D. HUNTER, .D., Duke University, 1976; R. H. HUTCHINS, .D., University of North Carolina at Chapel ll, 1976; A. T. HYDE, Jr., M.D., University of rginia, 1951; T. J. JASKI, M.D., St. Louis niversity, 1967; J. G. JEMSEK, M.D., University Illinois, 1974; J. A. JONES, M.D., Meharry edical College, 1974; W. H. JORDAN, M.D., arvard University, 1947; K. KARB, M.D., Uni- rsity of Virginia, 1972; J. D. KATZ, M.D., Uni- rsity of Pennsylvania, 1976; M. D. KAUFMAN, .D., Duke University, 1971; K. B. KLEIN, M.D., arvard University, 1975; H. KNODAPARAST, .D., Teheran University, Iran, 1967; G. E. DURY, M.D., Tulane University, 1944; D. S. AYTON, M.D., West Virginia University, 1976; S. LEBAUER, M.D., Duke University, 1965; S. LEBAUER, M.D., University of Virginia, 1967; J. LEE, M.D., Georgetown University, 1972; M. LEVIN, M.D., University of Pennsylvania, 75; S. L. LEVINSON, M.D., Cornell University, 74; A. R. LEWIS, M.D., Wake Forest University, 1965; D. M. LHOTSKY, M.D., Duke University, 1975; F. A. MAHER, M.D., Alexandria University, Egypt, 1968; C. A. MANGANO, Jr., M.D., University of Rochester, 1974; J. T. MANN III, M.D., University of North Carolina at Chapel Hill, 1969; W. K. MCRAE, M.D., Wake Forest University, 1964; H. W. MILLER, M.D., Wake Forest University, 1951; P. R. MILLER, M.D., Wake Forest University, 1967; J. A. MOORE, M.D., Medical College of Virginia, 1948; A. H. MOSS, M.D., University of Pennsylvania, 1975; J. F. MUNROE, M.D., University of North Carolina at Chapel Hill, 1960; S. M. NADEL, M.D., University of Florida, 1975; E. S. NEIJSTROM, M.D., University of Virginia, 1976; D. A. NEWTON, M.D., University of North Carolina at Chapel Hill, 1973; C. F. O'CAIN, M.D., Emory University, 1973; D. G. OLSON, M.D., Tulane University, 1974; J. P. OLMERT, Jr., M.D., Medical College of South Carolina, 1970; D. R. PATTERSON, M.D., University of North Carolina at Chapel Hill, 1973; D. M. PETERSON, Jr., M.D., University of Alabama, 1972; I. M. PIKE, M.D., Emory University, 1967; A. W. PITTMAN, M.S., University of North Carolina at Chapel Hill, 1978; M. A. POLLOCK, M.D., Jefferson Medical College, 1969; J. V. PUTHENVEETIL, M.D., Bangalore Medical College, 1963; R. H. RAASCH, Pharm D., University of California, 1975; M. J. RALLIS, M.D., George Washington University, 1977; R. W. REINDOLLAR, M.D., University of Maryland, 1975; S. P. ROBERTS, M.D., University of North Carolina at Chapel Hill, 1966; T. A. ROBERTS, Jr., M.D., University of North Carolina at Chapel Hill, 1970; J. B. ROSENBERG, M.D., University of Connecticut, 1977; J. C. SHAVER, M.D., Cornell University, 1962; G. Y. SHELLHORSE, M.D., Medical College of Georgia, 1977; E. H. SHOAF, M.D., Wake Forest University, 1975; W. V. SINGLETARY, M.D., Duke University, 1943; L. S. SLOTNICK, M.D., State University of New York at Brooklyn, 1971; J. H. SMITH, M.D., Medical College of Georgia, 1958; P. P. SMITH, M.D., University of Illinois, 1962; B. A. SPILKER, Ph.D., State University of New York, 1967; M.D., University of Miami, 1977; R. L. SUTTON, M.D., Ohio State University, 1974; J. G. TELFER, Jr., M.D., Washington University, 1971; A. R. THALINGER, M.D., University of Virginia, 1972; A. E. THOMAS, M.D., Medical College of Georgia, 1974; F. A. THOMPSON, M.D., University of North Carolina at Chapel Hill, 1975; S. S. TILLMAN, M.D., University of Florida, 1977; J. R. TYSINGER, M.D., Medical College of South Carolina, 1970; F. VAN NYNATTEN, M.D., Urije Univeriseit, Brussel, 1974; J. A. VILLIER, M.D., University of Kentucky, 1975; P. J. WALKER, M.D., Univer-

sity of Virginia, 1964; R. A. WEINTRAUB, M.D., Georgetown University, 1970; J. WEISSMAN, M.D., University of Illinois, 1970; B. M. WELBORNE, M.D., University of North Carolina at Chapel Hill, 1967; H. J. WENDORFF, M.D., Universidad Peruana Cayetana Heredia, Lima, Peru, 1972; P. C. WHITESIDES, Jr., M.D., University of South Carolina, 1977; H. L. WIDENER, M.D., Medical College of Virginia, 1968; W. T. WILLIAMS, Jr., M.D., Baylor University, 1973; J. WORTMAN, M.D., Northwestern University, 1974; V. H. WYNIA, M.D., Harvard University, 1972; E. B. YELLIG, M.D., Jefferson Medical College, 1969; C. D. YOUNG, M.D., University of Virginia, 1974.

## CLINICAL ASSISTANT PROFESSOR EMERITUS

J. T. BROOKS, M.D., University of Pennsylvania, 1943.

## ADJUNCT ASSISTANT PROFESSORS

D. H. HORSTMAN, Ph.D., Pennsylvania State University, 1969; A. R. JEFFCOAT, Ph.D., Indiana University, 1969; J. A. O'NEIL, Ph.D., University of California, 1974.

## CLINICAL INSTRUCTORS

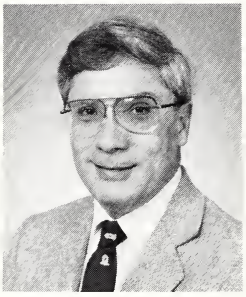
J. A. ACKERMAN, M.D., University of Vermont, 1976; C. A. ALLEN, M.D., University of North Carolina at Chapel Hill, 1974; M. J. ANDREWS, M.D., Georgetown University, 1972; W. K. AUSTIN, Jr., M.D., Medical College of Georgia, 1977; D. N. BHATT, M.B., B.S., Bawdo University, India, 1970; E. A. BEED, M.D., Northwestern University, 1977; D. F. BOERNER, M.D., University of Pennsylvania, 1976; S. A. BRANNING, M.D., University of Maryland, 1974; G. B. BROTHERS, M.D., Tufts University, 1976; W. P. BURGESS, M.D., University of Miami, 1977; Ph.D., Princeton University, 1972; S. J. CALVERT, M.D., Wake Forest University, 1947; J. E. DAVENPORT, M.D., University of New Mexico, 1974; R. C. DEMAS, M.D., Indiana University, 1965; J. S. DERBYSHIRE, M.D., Ohio State University, 1971; S. E. DURANTE, Jr., M.D., Meharry Medical College, 1973; N. K. GHOSH, M.B.B.S., N.R.S., Medical College, Calcutta, India, 1959; W. B. GRUHN, Ph.D., Northwestern University, 1971; M.D., Dartmouth University, 1974; C. W. GUEST, M.D., University of Oklahoma, 1974; G. K. GUPTA M.D., Delhi University, India, 1970; C. HANSEN, M.A., University of North Carolina a Greensboro, 1981; E. M. HART-BROTHERS M.D., Tufts University, 1976; R. W. HARDINC M.D., State University of New York at Buffal 1964; S. J. HAWES, Jr., M.D., University North Carolina at Chapel Hill, 1976; M. L. HEN DERSON, M.D., Loyola University, 1949; D. HENKE, M.D., University of North Carolina Chapel Hill, 1977; D. A. HESTER, M.D., Unive sity of Oklahoma, 1973; M. K. JOHNSON II M.D., University of Alabama, 1974; J. K. KEENEI M.D., University of St. Louis, 1975; W. L. KEN NEDY, M.D., Wake Forest University, 1975; I. M KHAN, M.B., B.S., King Edward Medical Colleg Pakistan, 1966; G. R. KILPATRICK, Jr., M.D Meharry Medical College, 1968; A. K. KRON HAUS, M.D., Boston University, 1972; M. LOCKWOOD, M.D., New York University, 196 R. S. LOTWIN, D.P.M., California College Podiatric Medicine, 1969; J. J. LUND, M.D., Ur versity of Virginia, 1957; E. S. McCONNEL M.S., Duke University, 1978; W. D. McKEOWN M.D., Wake Forest University, 1976; E. H. MI LER, M.D., University of South Carolina, 1975; H. MOORE III, M.D., Emory University, 197 G. T. A. MORRIS, M.D., Wake Forest Universit 1959; L. R. NEWELL, M.D., University of Nor Carolina at Chapel Hill, 1975; B. A. OLSOI M.D., University of Bologna, Italy, 1972; J. PARSONS, M.D., University of North Caroli at Chapel Hill, 1976; W. B. PITTMAN, M.I University of North Carolina at Chapel Hill, 197 L. E. PRICE, B.S., Pennsylvania State Universi 1973; C. A. PROCTOR, M.D., University North Carolina at Chapel Hill, 1968; T. B. RE III, M.D., University of North Carolina at Cha Hill, 1980; C. D. RHODES, Jr., M.D., Wake For University, 1956; J. G. SCANLAN, M.D., Nor western University, 1973; S. E. SCOTT, M.I University of North Carolina at Chapel Hill, 19 M. M. SEEK, M.D., University of Missouri Kansas City, 1979; N. B. SHAH, M.D., Gujar University, India, 1973; T. C. SMITH, M.D., O State University, 1971; T. L. SNOW, M.S., U versity of North Carolina at Chapel Hill, 1980; SPANGENTHAL, M.D., University of C Town, Africa, 1974; R. C. SULLIVAN, Jr., M. University of Florida, 1969; T. C. SUNBER ARZT, Wuerzburg University, West Germa 1977; S. N. TENNANT, M.D., Wake For University, 1978; D. C. THURBER, Jr., M. University of Rochester, 1977; A. V. WA M.S.W., Howard University, 1954; J. M. WA REN, M.D., University of Virginia, 1956; M. WHITE III, M.D., University of North Carolin

hapel Hill, 1979; D. WILDMAN, M.S.W., West irginia University, 1977; P. F. WILLIAMS, M.D., niversity of Pennsylvania, 1955; J. C. OODARD, M.D., University of North Carolina t Chapel Hill, 1968; M. J. ZELLINGER, M.D., uke University, 1974; S. H. ZIMMERMAN, I.D., Johns Hopkins University, 1974.

## ELLOWS

ACKER, M.D., University of Western Ontario, anada, 1977; R. ANTONUCCI, M.D., Mount Si- ai School of Medicine, 1980; A. BASS, Ph.D., ouisiana State University, 1982; B. BERKO, .D., Tufts University, 1977; N. BERNARD, n.D., Duke University, 1982; H. BERSCHNEI- ER, D.V.M., Iowa State University, 1982; J. ACK, M.D., University of North Carolina at hapel Hill, 1977; B. BRITIGAN, M.D., Univer- y of Southern California, 1980; W. BYNUM, .D., University of North Carolina at Chapel ill, 1979; T. CAREY, M.D., University of Ver- ont, 1976; W. CASCIO, M.D., University of aryland, 1980; M. COLLMAN, M.D., Albany edical College, 1979; L. CROMARTIE, M.D., niversity of North Carolina at Chapel Hill, 1979; DITTUS, M.D., Indiana University, 1978; R. ODD, M.D., University of Chicago, 1978; B. VERETT, M.D., Tufts University, 1979; D. TCH, M.D., University of Michigan, 1979; D. EORGE, M.D., University of Mississippi, 1978; GODWIN, M.D., University of Alabama, 1978; GRAY, M.D., Eastern Virginia Medical School, 79; J. HARSHBARGER, M.D., Temple Univer- y, 1980; J. HOUGHTON, M.D., University of aryland, 1980; M. IVANICK, M.D., Brown Uni- rsity, 1978; S. KABIS, M.D., Rutgers Medical School, 1979; H. KEHRL, M.D., University of Michigan, 1977; J. KITTINGER, M.D., University of Arkansas, 1980; W. MAULE, M.D., University of Texas Medical School at San Antonio, 1979; W. MENTZ, M.D., West Virginia University, 1977; A. MERCER, M.D., University of Louisville, 1978; D. MONROE, Ph.D., University of North Carolina at Chapel Hill, 1983; B. MYONES, M.D., Albany Medical College, 1977; H. NARVARTE, M.D., University of Chile, 1976; T. NICHOLS, M.D., Medical College of Virginia, 1978; C. PAGANINI, M.D., University of Florida, 1980; D. PASI, M.B.B.S., All India Institute of Medical Sciences, 1974; J. PRINCE, M.D., Medical College of Virginia, 1980; M. RUDD, Ph.D., Wake Forest University, 1983; J. SARGENT, M.D., Medical College of Virginia, 1979; S. SAVITEER, M.D., University of Connecticut, 1980; R. SCHREIBER, M.D., State University of New York, Downstate Medical Center, 1980; B. SHULKIN, M.D., University of Texas, Southwestern Medical School, 1978; R. SIGMON, M.D., University of North Carolina at Chapel Hill, 1979; R. SILLIMAN, M.D., University of Washington, 1977; R. SNIPES, M.D., University of North Carolina at Chapel Hill, 1980; T. SWANTKOWSKI, M.D., Temple University, 1978; S. TURKER, M.D., Mount Sinai School of Medicine, 1979; C. VAN DER HORST, M.D., Harvard University, 1979; R. VENDER, M.D., Hahnemann Medical College, 1979; K. WAYS, M.D., Ph.D., University of North Carolina at Chapel Hill, 1980, 1978; P. WEINBERG, M.D., Emory University, 1980; J. WHEAT, M.D., University of Alabama, 1976; A. WOELFEL, M.D., University of Texas Southwestern Medical School; A. YAMADA, M.D., University of Tokyo, 1973; J. YANKASKAS, M.D., University of Connecticut, 1978.

# The Department of Microbiology and Immunology



Faculty of the Department of Microbiology and Immunology conduct a wide range of research on procaryotic and eucaryotic cells, including bacterial physiology and genetics, RNA and DNA viruses, humoral and cellular immunology, and gene structure and function in higher eucaryotes. Emphasis is on both applied problems (e.g., microbial pathogenesis, mechanisms of inflammation) and basic problems in the molecular biology of microorganisms and eucaryotic cells. Many faculty hold joint appointments in other departments, centers or curricula, and there are many interactive research programs. The department is very well equipped for modern research. Facilities include special centers for microprotein sequencing and fluorescence activated flow cytometry; many laboratories are actively engaged in DNA sequencing, recombinant DNA, monoclonal antibody production, and a host of related methodologies. Teaching programs include courses and supervised research training for over 40 Ph.D. or M.D.-Ph.D. candidate students, and numerous courses in microbiology and immunology for students in the Schools of Medicine, Dentistry, Pharmacy, and Nursing.

## PROFESSORS

P. F. SPARLING (Chair), M.D., Harvard University, 1962

K. F. BOTT, Ph.D., University of Syracuse, 1963

W. A. CLYDE, Jr., M.D., Vanderbilt University, 1954

W. J. CROMARTIE, M.D., Emory University, 1937

M. H. EDGELL, Ph.D., Pennsylvania State University, 1965

J. D. FOLDS, Ph.D., Medical College of Georgia, 1967

J. A. FRELINGER, Ph.D., California Institute of Technology, 1973

H. GOODER, Ph.D., Leeds University, England, 1952

J. S. HASKILL, Ph.D., University of Toronto, Canada, 1966

G. HAUGHTON, Ph.D., University of Southampton, England, 1958

C. A. HUTCHISON III, Ph.D., California Institute of Technology, 1968

G. P. MANIRE, Ph.D., University of California, 1949

J. S. PAGANO, M.D., Yale University, 1957

J. H. SCHWAB, Ph.D., University of Minnesota, 1953

D. G. SHARP (Emeritus), Ph.D., Duke University, 1939

W. R. STRAUGHN (Emeritus), Ph.D., University of Pennsylvania, 1958

G. T. WERTZ, Ph.D., University of Pittsburgh, 1970

J. YOUNT, M.D., University of Wisconsin, 60

## SSOCIATE PROFESSORS

L. BACHENHEIMER, Ph.D., University of icago, 1972

COHEN, M.D., Yale University, 1972

A. EISENBERG, M.D., Stanford University, 71

. FISCHER, M.D., Johns Hopkins University, 48

GRIFFITH, Ph.D., California Institute of Tech- ogy, 1969

M. HADLER, M.D., Harvard University, 1968

. HUANG, Ph.D., University of North Caro- a at Chapel Hill, 1971

G. KLAPPER, Ph.D., University of Florida, 72

R. McGINNIS, Ph.D., Iowa State University, 69

. NEWBOLD, Ph.D., California Institute of hnology, 1970

REISNER, Ph.D., Case Western Reserve Uni- sity, 1973

D. ROSS, Ph.D., University of Florida, 1971

TWAROG, Ph.D., University of Illinois, 1962

. WYRICK, Ph.D., University of North Caro- a at Chapel Hill, 1971

## SISTANT PROFESSORS

. BASSFORD, Ph.D., University of Virginia, 7

. BOWDRE, Ph.D., Virginia Polytechnic and e University, 1976

. CANNON, Ph.D., University of North olina at Chapel Hill, 1978

S. COHEN, M.D., Rush Medical College, 1974

M. SOBSEY, Ph.D., University of California at Berkeley, 1971

## INSTRUCTORS

B. F. MAXWELL, B.A., University of North Carolina at Greensboro, 1951

## LECTURERS

S. CANCELOSI, Ph.D., University of Virginia, 1977

J. J. CRAWFORD, Ph.D., University of North Carolina at Chapel Hill, 1962

## RESEARCH ASSISTANT PROFESSORS

L. ARNOLD, Ph.D., University of Nebraska, 1979

S. NEWMAN, Ph.D., University of Alabama, 1978

## VISITING ASSISTANT PROFESSORS

B. PRIEST, Ph.D., University of Birmingham, United Kingdom, 1973

## ADJUNCT ASSISTANT PROFESSORS

L. ELWELL, Ph.D., University of Oregon, 1974

T. A. KUNKEL, Ph.D., University of Cincinnati, 1977

L. S. RIPLEY, Ph.D., University of Illinois at Urbana-Champaign, 1974

## POSTDOCTORAL FELLOWS

J. Alexander; C. Barbier; G. Bogosian, P. Collins; K. Cozad; D. Dyer; S. Hardies; R. Hodinka, Y. Huang; S. Martin; J. Saunders; B. Schepart, J. Stapleton; S. Stimpson; M. Takiguchi.

## CURRICULUM

This department offers instruction in the Schools of Medicine, Nursing, Dentistry, Pharmacy, and Arts and Sciences, and conducts an active program in the Graduate School for students seeking the Ph.D. degree. Details of these programs can be found in the Graduate School catalog.

The following courses are available as senior electives in the School of Medicine: Microbiology 105, 110, 115, 120, 130, 190, 191, 210, 211, 212, 213.

51. ELEMENTARY BACTERIOLOGY (4). Required for pharmacy students. Prerequisites: Chemistry 11-12 or 11-21. Covers the general principles and techniques of bacteriology and the relations of these organisms to sanitation, agriculture, medicine and industry. *3 lecture and 2 laboratory hours a week. Fall.* Twarog.

55. ELEMENTARY PATHOGENIC MICROBIOLOGY (4). Required for nursing and dental hygiene students; other students by permission of the department. Prerequisites: Chemistry 11-12 or 11-21. A course covering the fundamental principles of microbiology; the relations of microorganisms to disease; modes of infection, and the etiologic agents of the important infectious diseases. *3 lecture and 2 laboratory hours a week. Spring.* Bowdre.

112. INTRODUCTION TO MICROBIOLOGY (2). Open only to dental students. A course covering basic aspects of microbiology including sterilization, disinfection, action of antimicrobial chemotherapeutic agents, concepts of infection and immunity and the study of certain selected infectious agents. *28 lecture hours and 7 laboratory hours. Spring.* Gooder; staff.

### *Courses for Graduates*

100. BIOLOGY AND BIOCHEMISTRY OF MICROORGANISMS (5). Prerequisites: Biology 21, 22 *or* Biology 11, *and* Chem. 61 *or* their equivalents *or* permission of instructor. The structure and function of bacteria and viruses and their chemical and genetic relationships are stressed. Their use as model systems for genetic, developmental and environmental studies is also explored. *3 lecture and 4 laboratory hours. Fall.* Bassford, Bott. (Not offered 1981–1984).

105. MOLECULAR AND CELLULAR BASIS OF PROKARYOTIC MICROBIOLOGY (4). Prerequisites: organic chemistry, permission of department except for department majors. Basic concepts of the structure, metabolism, growth and reproduction, genetics and control and regulation of procaryotes and single cell eucaryote systems. *4 lecture hours per week. Fall.* Bassford; staff.

110. IMMUNOLOGY (3). Prerequisite: organic chemistry and permission of department except for department majors. The molecular and cellular basis of antibody formation, hypersensitivity, resistance to infection, immunochemistry, and immunogenetics. *3 lecture hours. Fall.* Haughton; staff.

114. IMMUNOBIOLOGY (3). Prerequisites: Biology 11 or Biol. 21/Micro. 51 or 55, Chem. 11, 21. For students with primary focus other than immunology. Immunochemistry; genetic control, regulation and development of cells and cell interactions: hypersensitivity, autoimmunity, resistance to infection. *2 lectures, 1 seminar. Fall.* Schwab.

115. SPECIAL TOPICS IN BACTERIOLOGY OR IMMUNOLOGY (3 or more each semester). Permission of the department required except for department majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. *Hours and credit to be arranged, any term.* May be repeated for credit two or more semesters. Staff.

120. MICROBIAL PATHOGENESIS (4). Prerequisites: Micro. 105, 110. Molecular and biological basis of pathogenic properties of bacteria. *4 lecture hours. Spring.* Wyrick; staff.

130. VIROLOGY (4). Prerequisites: Micro. 105, 110. Current concepts of the chemistry, structure, replication, genetics and natural history of animal viruses and their host cells. *4 lecture hours. Spring.* Bachenheimer, Wertz.

180. CELLULAR AND MOLECULAR BIOLOGY OF CANCER (3). Basic concepts of the etiology, molecular biology, genetics, immunology and clinical aspects of cancer. Lectures and discussions by members of Cancer Research Center. *3 lecture hours. Fall.* Staff. (Not offered 1982–1984).

189. NUCLEIC ACID TECHNIQUES (Biology 189, Genetics 189) (4). Prerequisites: some molecular biology, permission of instructor. An intensive course covering many aspects of recombinant DNA technology such as: cDNA preparation, gel analysis, southerns, nick translations, Berk-Sharp analysis, library analysis, and DNA sequencing. Fee required. *8 laboratory hours. Spring.* Newbold, staff.

190. EUCARYOTIC GENE ORGANIZATION (Genetics 190) (4). Prerequisite: Organic Chemistry, permission of instructor. Basic concepts of classical chromosomal structure, function and mechanics. Eucaryotic molecular genetics and cellular regulation will be emphasized. Readings, short answer examinations, term project. *4 lecture hours. Fall.* Hutchison.

191. EUCARYOTIC GENE CONTROL (Genetics 191) (3). Prerequisites: Micro. 190 and permission of instructor. Current research and possible new approaches to elucidating the mechanisms of eucaryotic gene control will be critically analyzed. *3 seminar hours. Spring.* (Not offered 1982–1985).

192. MEDICAL MICOLOGY (Palp. 192) (4). Prerequisite: general microbiology or botany, permission of instructor. Isolation, identification, epidemiology, mycoserology, and clinical importance of medically significant fungi. Identification of hyphomycetes and yeasts will be stressed. *2 lecture, 3 laboratory hours. Fall.* McGinnis.

201, 202. SEMINAR IN MICROBIOLOGY (1 each). Discussion of selected topics in microbiology. *1 lecture hour a week. Fall and spring.* Staff.

210. SEMINAR/TUTORIAL IN MICROBIAL CHEMISTRY AND GENETICS (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. *Fall.* Cannon.

211. SEMINAR/TUTORIAL IN IMMUNOLOGY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. *Fall.* Newbold.

212. SEMINAR/TUTORIAL IN IMMUNOLOGY (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. *Fall.* Frelinger.

213. SEMINAR/TUTORIAL IN THE BIOLOGY OF CANCER: VIRUSES AND THE IMMUNE RESPONSE (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be placed on current literature, invited speakers, rather than textbooks. *Fall.* (Not offered 1982–1984).

275. GENETICS SYSTEMS. (Biochem. 275, Biology 275, Genetics 275, Pathology 275). (3). An advanced course in genetics emphasizing the genetics and molecular biol-

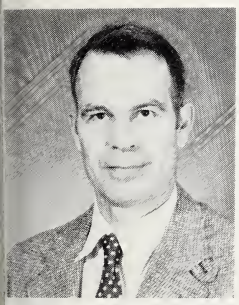
ogy of viruses, bacteria, fungi, insects and mammals and based upon research of staff. *Fall.* (1984 and alternate years). Staff.

301. RESEARCH (5 or more each semester). Permission of the department required. Opportunity is offered properly prepared students to undertake research in clinical bacteriology, immunology, virology, microbial genetics, or bacterial physiology. *Hours and credit to be arranged, any term.* This course may be repeated for credit two or more semesters. Staff.

393. MASTER'S THESIS.

394. DOCTORAL DISSERTATION.

# The Department of Neurology



The study of neurology, an essential part of general medicine education, offers valuable preparation for general medicine, pediatrics and surgery as well as the specialties of adult and child neurology, neurosurgery, neuro-ophthalmology, neuropathology and neuroradiology. The rapid expansion of basic and clinical neuroscience knowledge provides a challenge to the excellence of neurological medical education. The UNC Department of Neurology participates in interdepartmental courses (Years I-III) and offers electives in research, adult neurology and child neurology. The goals of the undergraduate neurological curriculum are mastery of the following: 1) neurological exam; 2) principles of topographic neurological localization; 3) cardinal manifestations of neurological disease; 4) laboratory investigation of neurological disease; 5) specific neurological disorders. Adult and child neurological postgraduate residencies, approved by the American Board of Psychiatry & Neurology, are available. Fellowship programs in Clinical Neurophysiology and Neuromuscular Diseases are offered. Inquiries to (919) 966-2526.

## 'ROFESSORS

N. HAYWARD (Chair) (H. Houston Merritt Distinguished Professor of Neurology and Medicine), M.D., Tufts University, 1954

. W. FARMER (Sarah Graham Kenan Professor f Neurology and Medicine), M.D., Harvard Uniersity, 1941

. D. HALL, M.B., Ch.B., Aberdeen University, cotland, 1966

.. N. JOHNSON, Sc.D., University of Virginia, 969

. A. O'TUAMA, M.B., B.Ch. University Col-ge, Ireland, 1962 (Resigned June 1983)

## SSOCIATE PROFESSORS

.. L. EHLE, M.D., University of Washington, 967

. S. GREENWOOD, M.D., University of Texas Galveston, 1968

J. D. MANN, M.D., Cornell University, 1969

## ASSISTANT PROFESSORS

J. J. BRICKLEY, Ph.D., University of Virginia, 1978 (Resigned June 1983)

J. F. HOWARD, Jr., M.D., University of Vermont, 1974

R. B. MEEKER, Ph.D., Bowling Green University, 1976

J. A. MESSENHEIMER, M.D., Johns Hopkins University, 1970

S. R. QUINT, Ph.D., University of Virginia, 1977

## INSTRUCTOR

M. B. TENNISON, M.D., Harvard University, 1975

## RESEARCH ASSISTANT PROFESSORS

J. D. CHARLTON, Ph.D., University of Virginia, 1978

E. G. HAYECK, Ph.D., University of Virginia, 1980 (Resigned November 1983)

C. S. KIM, Ph.D., University of North Carolina at Chapel Hill, 1976

R. H. PROPST, Ph.D., North Carolina State University, 1970

## ADJUNCT ASSOCIATE PROFESSOR

M. L. MCCARTNEY, Sc.D., University of Virginia, 1967

## CLINICAL PROFESSOR

H. W. GILLEN, M.D., University of Illinois, 1949

## CLINICAL ASSOCIATE PROFESSORS

M. A. HATCHER, Jr., M.D., Duke University, 1962

J. W. LEDBETTER, M.D., Wake Forest University, 1953

A. W. RENUART, M.D., Duke University, 1955

J. W. STIEFEL, M.D., University of Tennessee, 1958

M. S. WINGFIELD, M.D., Medical College of Virginia, 1959

## CLINICAL ASSISTANT PROFESSORS

J. U. ADELMAN, M.D., Northwestern University, 1967

C. T. DURHAM, Jr., M.D., Medical College of South Carolina, 1966

S. M. FREEDMAN, M.D., University of Pennsylvania, 1972

P. L. JACOBSON, M.D., Washington University, 1977

J. B. KISER, M.D., Medical College of Virginia, 1971

J. M. LOVE, M.D., Duke University, 1972

D. L. MARTIN, M.D., University of Virginia, 1965

T. B. MCGHEE, M.D., Medical College of Georgia, 1976

N. K. WENG, M.D., University of Malaysia, 1956

## CLINICAL INSTRUCTORS

R. W. ECKEL, M.D., Case Western Reserve University, 1976 (Resigned October 1983)

C. C. HAWORTH, M.D., Duke University, 1963

R. D. SERANO, M.D., University of Virginia 1973

# The Department of Obstetrics and Gynecology

The Department of Obstetrics and Gynecology has as its mission quality education for medical students and residents, innovative research, and quality patient care. In its mission relative to quality education for medical students and residents, there are faculty not only at North Carolina Memorial Hospital, but also at Wake County Memorial Hospital in Raleigh, New Hanover Memorial Hospital in Wilmington, Charlotte Memorial Hospital in Charlotte and Moses Cone Hospital in Greensboro. Of those residents who have completed this program, 14 are now in academic medicine and 50 are practicing in North Carolina. In providing quality patient care to the people of North Carolina, the department is fortunate to have among its faculty highly recognized specialists in maternal/fetal medicine, gynecologic oncology, reproductive endocrinology and general gynecology. Its programs in high-risk obstetrics, fetal surgery, in vitro fertilization and gynecologic oncology are effective and productive. The research activities now ongoing include studies on endometriosis, fetal heart monitoring, and chemotherapy protocols for cancer patients.

## ROFESSORS

DROEGEMUELLER (Chair), M.D., University Colorado, 1960

BOWES, M.D., University of Colorado, 1959

BRAME, M.D., University of North Carolina, 55

CEFALO, M.D., Tufts University, 1959; Ph.D., orgetown University, 1974

EASTERLING, M.D., University of North rolina, 1956

FOWLER, M.D., University of North Caro- a, 1966

HASKILL, Ph.D., University of Toronto, 1966

HENDRICKS, M.D., University of Michigan, 3

HULKA, M.D., Columbia University, 1956

TALBERT, M.D., University of Virginia, 1953

## ASSOCIATE PROFESSORS

J. DALEY, M.D., Yale University, 1951

W. HERBERT, M.D., Wake Forest University, 1972

J. HISLEY, M.D., University of Maryland, 1965

M. RAJ, Ph.D., Indian Institute of Science, 1969

G. RIEMAN, M.D., University of Virginia, 1952

L. WALTON, M.D., State University of New York, 1964

F. WIEGAND, M.D., Hahnemann School of Medicine, 1946

## ASSISTANT PROFESSORS

J. BURNETT, M.D., University of Michigan, 1943

J. CURRIE, M.D., University of North Carolina, 1967

J. HALL, M.D., Medical University of South Carolina, 1974

J. HALME, M.D., University of Helsinki, 1968 Ph.D., University of Helsinki, 1970

M. HAMMOND, M.D., University of Florida, 1974

J. SEEDS, M.D., University of Virginia, 1972

## ADJUNCT PROFESSOR

M. J. GRAY, M.D., Washington University, 1959

## ADJUNCT ASSOCIATE PROFESSOR

D. EDELMAN, Ph.D., University of North Carolina, 1972

## ADJUNCT ASSISTANT PROFESSOR

J. HALL, Ph.D., University of Mississippi, 1974

## RESEARCH ASSISTANT PROFESSOR

S. BECKER, Ph.D., Karolinska Institute, 1981

## CLINICAL PROFESSORS

A. RICHARDSON, M.D., Emory University, 1945

B. RIMER, M.D., University of North Carolina, 1957

## CLINICAL ASSOCIATE PROFESSORS

A. BROWN, M.D., Queens University, 1943

T. CRIST, M.D., University of North Carolina, 1965

C. FICKLEN, M.D., University of Virginia, 1954

F. HEATON, M.D., University of North Carolina, 1972

O. JONES, M.D., Columbia University, 1930

B. LAPRADE, M.D., University of Virginia, 1956

J. McGEE, M.D., University of North Carolina, 1958

W. NEBEL, M.D., University of North Carolina, 1958

R. RANKIN, M.D., University of Pennsylvania, 1952

D. SCARBOROUGH, M.D., University of North Carolina, 1952

A. SUMMERLIN, M.D., University of Virginia, 1948

## CLINICAL ASSISTANT PROFESSORS

R. BASHFORD, M.D., University of North Carolina, 1971

K. BARKLEY, M.D., University of North Carolina, 1962

J. BAKER, M.D., University of North Carolina, 1974

J. BARKER, M.D., University of Buffalo, 1957

D. COPELAND, M.D., Duke University, 1972

T. FLANAGAN, M.D., Meharry Medical College, 1971

W. FORT, M.D., University of Tennessee, 1960

M. FRIED, M.D., New York University, 1971

M. FULGHUM, M.D., University of North Carolina, 1971

R. GAITHER, M.D., Meharry Medical College, 1969

S. GILMORE, M.D., Indiana University, 1968

J. GLOVER, M.D., University of North Carolina, 1957

H. GRANT, M.D., University of North Carolina, 1969

T. GREER, M.D., Wake Forest University, 1954

N. GRIFFIN, M.D., Vanderbilt University, 1957

W. HALL, M.D., Duke University, 1961

L. HATLEY, M.D., University of North Carolina, 1976.

R. HAYES, M.D., Ohio State University, 1966

B. HAYWOOD, M.D., Meharry Medical College, 1970

F. HOFFMAN, B.S., North Carolina Central University, 1963

W. HOLT, M.D., Case Western Reserve, 1964

H. JOHNSON, M.D., Duke University, 1955

L. KAASA, M.D., University of Minnesota, 1941

R. KAMM, M.D., University of Iowa, 1970

R. KRAMER, M.D., Albany Medical College, 1976

F. KRONCKE, M.D., University of North Carolina, 1970

J. LANE, M.D., Duke University, 1972

R. LASSITER, M.D., University of North Carolina, 1965

H. LAWRENCE, M.D., Indiana University, 1975

C. LOMAX, M.D., Wake Forest University, 1968

S. McKENZIE, M.D., University of North Carolina, 1974

H. MEZER, Tufts University, 1977

R. MINTZ, M.D., University of North Carolina, 1967

. MOHR, M.D., Tufts Medical College, 1953

B. MORGAN, M.D., Wake Forest University, 947

A. MORRIS, M.D., University of North Carolina, 1959

S. PARKER, M.D., George Washington University, 1942

T. PARKER, M.D., Jefferson Medical College, 951.

H. PETERSON, M.D., University of Pittsburgh, 977

G. STEWART, M.D., University of North Carolina, 1971

. SWAIN, M.D., University of North Carolina, 973

. TATUM, M.D., Medical College of South Carolina

J. THORP, M.D., University of North Carolina, 1957

S. VAUGHN, Ph.D., University of Arizona, 1980.

R. WEIN, M.D., University of Virginia, 1972

R. WELHAM, M.D., Temple University, 1965

R. WING, M.D., University of North Carolina, 1976

L. WOODRUFF, M.D., Wake Forest University, 1972

## CLINICAL INSTRUCTORS

H. ADAMS, M.D., University of North Carolina, 1955

D. BAIR, M.D., University of Oregon, 1976

G. HAWKINS, M.S., Case Western Reserve, 1969

L. LINDLEY, M.A., University of Massachusetts, 1983

M. McLENDON, M.S.N., University of North Carolina, 1979

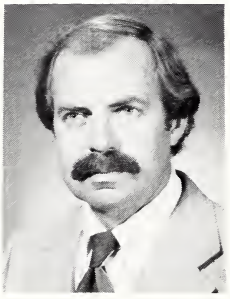
M. MOOS, M.P.H., University of North Carolina, 1978

T. MYERS, M.D., West Virginia University, 1976

P. SMITH, R.N., Polk County Hospital, 1969

R. YOUNG, M.D., Medical College of Virginia, 1975

# The Department of Ophthalmology



The Department of Ophthalmology provides clinical subspecialty services in neuro-ophthalmology, medical and surgical retinal disease, corneal surgery and external disease, pediatric ophthalmology, glaucoma, low vision, clinical and experimental ocular pathology, oculo-plastic surgery and inpatient consultations. The basic missions of teaching, research, and patient care are accomplished through these subspecialty services. The department is interested in teaching at all levels and provides didactic lectures, conferences, and clinical rotation for medical students on the first, second, third and fourth year levels. The three-year departmental residency program consists of nine residents with three in each year's class. Continuing medical education conferences are provided for practicing ophthalmologists in all areas of ophthalmology at least every third month. The Ophthalmology Department is not only active in clinical research, but permanent laboratory space is available for basic science research projects as well.

## PROFESSORS

D. E. EIFRIG (Chair), M.D., Johns Hopkins University, 1960

J. C. MERRITT, M.D., Howard University, 1970

## ASSOCIATE PROFESSORS

B. S. GRIMSON, M.D., Duke University, 1969

R. L. PEIFFER, D.V.M., Ph.D., University of Minnesota, 1971, 1980

## ASSISTANT PROFESSORS

M. CHANG, M.D., New York University, 1971

K. L. COHEN, M.D., University of Illinois, 1971

## RESEARCH ASSISTANT PROFESSOR

K. K. SULIK, Ph.D., University of Tennessee, 1976

## LECTURERS

J. P. PANTELL, B.F.A., Rochester Institute o Technology, 1971

G. L. WARE, B.A., University of North Carolir at Chapel Hill, 1975

## CLINICAL PROFESSOR

L. M. HALE, M.D., University of North Carolir at Chapel Hill, 1961

## CLINICAL ASSISTANT PROFESSORS

M. W. BRENNAN, M.D., University of Texas San Antonio, 1978

J. J. BUSSA, M.D., University of Texas at S Antonio, 1978

F. H. CHRISTENSEN, M.D., St. Louis Universit 1976

W. W. FOSTER, M.D., Wake Forest Universit 1972

E. V. GRACE, M.D., University of Michigan, 1956

S. L. GULLEDGE, M.D., Wake Forest University, 1976

H. T. LEWIS, O.D., Columbia University, 1940

P. L. MARTIN, M.D., University of North Carolina at Chapel Hill, 1973

T. P. WERBLIN, M.D., Ph.D., New York University, 1972

# The Department of Pathology

The major goal of the Department of Pathology is to achieve excellence in teaching, diagnostic services, and research. The faculty members of the Department of Pathology are active in each of these three areas of responsibility. Faculty provide instruction to students, residents, and fellows about basic and advanced aspects of pathology, including the application of pathology and laboratory medicine to medical practice, and the elucidation and application of new observations from research studies. We operate the diagnostic laboratories of North Carolina Memorial Hospital, and provide diagnostic interpretation of the data produced to patients and their physicians. Research studies on selected aspects of the cause and mechanisms of lesions and diseases that afflict man and other animals undergirds our efforts in teaching and diagnosis.

## PROFESSORS

J. W. GRISHAM (Chair), M.D., Vanderbilt University, 1957

F. B. ASKIN, M.D., University of Virginia, 1964

W. R. BENSON, M.D., Duke University, 1944

E. B. CLARK (Emeritus), Ph.D., University of North Carolina at Chapel Hill, 1963

F. G. DALLDORF, M.D., Cornell University, 1958

J. D. FOLDS, Ph.D., Medical College of Georgia, 1967

D. T. FORMAN, Ph.D., Wayne State University, 1959

J. D. GERATZ, M.D., J. W. Goethe University, 1953

J. B. GRAHAM (Alumni Distinguished Professor), M.D., Cornell University, 1942

R. P. HUDSON, Jr., M.D., Medical College of Virginia, 1956

W. D. HUFFINES, M.D., University of North Carolina at Chapel Hill, 1955

J. R. JACOWAY, D.D.S., University of Tennessee, 1954; Ph.D., Georgetown University, 1975

D. G. KAUFMAN, M.D., Ph.D., Washington University, 1968, 1973

M. R. KRIGMAN, M.D., Cornell University, 1958

W. J. KUHNS, M.D., Johns Hopkins University, 1948 (Retired 10/1/83)

R. D. LANGDELL, M.D., George Washington University, 1948

R. L. LUNDBLAD, Ph.D., University of Washington at Seattle, 1965

A. J. MCBAY, Ph.D., Purdue University, 1948

W. W. MCLENDON, M.D., University of North Carolina at Chapel Hill, 1956

J. R. PICK, D.V.M., University of Georgia, 1961

H. R. ROBERTS, M.D., University of North Carolina at Chapel HIll, 1955

E. V. STAAB, M.D., University of Minnesota, 1961

M. C. SWANTON (Emeritus), M.D., Johns Hopkins University, 1946

R. H. WAGNER, Ph.D., University of Cincinnati, 1950

W. P. WEBSTER, D.D.S., University of North Carolina at Chapel Hill, 1959

## PROFESSOR AND CHAIRMAN EMERITUS

. M. BRINKHOUS, M.D., University of Iowa, 932

## ASSOCIATE PROFESSORS

. N. MALOUF (ANDERSON), M.D., American niversity of Beirut, Lebanon, 1963

. A. BENTLEY, M.B., B.S., M.D., University of ondon, England, 1966, 1981

. N. CARNEY, M.D., University of Alabama, 963

. A. COOPER, M.D., University of Kansas, 964

. CRONENBERGER, Ph.D., University of Texas Houston, 1972

. E. CROSS, Ph.D., University of Florida, 1971

R. GRIGGS, M.D., University of North Caro- a at Chapel Hill, 1969

E. HAMMOND, Ph.D., University of Florida at ainesville, 1974

. R. MCGINNIS, Ph.D., Iowa State University, 969

MUSHAK, Ph.D., Florida University, 1970

L. PEIFFER, Jr., D.V.M., Ph.D., University of innesota, 1971, 1980

. M. REISNER, Ph.D., Case Western Reserve niversity, 1974

. W. ROSS, M.D., University of California at rkeley, 1972; Ph.D., University of San Francis- , 1974

W. SHERMER, M.D., University of North arolina at Chapel Hill, 1963

L. THOMPSON, M.D., University of Missis- pi, 1961

R. TIDWELL, Ph.D., University of Tennessee, 74

. D. TOPAL, Ph.D., New York University, 1973

H. WALKER, M.D., Vanderbilt University, 69

## ASSISTANT PROFESSORS

A. BELLINGER, Ph.D., Wake Forest Univer- y, 1981; D.V.M., University of Georgia, 1976

T. W. BOULDIN, M.D., University of North Carolina at Chapel Hill, 1974

J. H. BOWDRE, Ph.D., Virginia Polytechnic Institute, 1976

J. D. BUTTS, M.D., Duke University, 1972

J. CHANG, D.V.M., Taiwan University, 1964; Ph.D., University of Missouri, 1971

J. F. CHAPMAN, Jr., Dr.P.H., University of North Carolina at Chapel Hill, 1978

D. CHOU, M.D., University of Pennsylvania at Pittsburgh, 1974

M. L. COLLINS, M.D., Ph.D., Washington University, 1976, 1977

D. M. FOWLKES, M.D., Ph.D., Cornell University, 1976, 1977

M. J. GRIFFITH, Ph.D., University of Texas at San Antonio, 1977

J. C. JENNETTE, M.D., University of North Carolina at Chapel Hill, 1973

D. T. MILLER, M.D., University of Nebraska, 1975; Ph.D., University of Virginia, 1969

R. L. REDDICK, M.D., University of North Carolina at Chapel Hill, 1973

G. P. SIEGAL, M.D., University of Kentucky at Louisville; Ph.D., University of Minnesota, 1979

L. M. SILVERMAN, Ph.D., Ohio State University, 1975

## CLINICAL PROFESSORS

A. L. DEE, M.D., Johns Hopkins University, 1951

H. Z. LUND, M.D., University of Pennsylvania, 1931

## CLINICAL ASSOCIATE PROFESSORS

C. M. HASSELL, M.D., University of Pennsylvania, 1958

D. D. LEONARD, M.D., Case Western Reserve University, 1957

P. M. MACKENZIE, M.D., Medical College of South Carolina, 1944

H. A. WILKINSON, M.D., Medical College of Georgia, 1960

## CLINICAL ASSISTANT PROFESSORS

H. W. BAIRD, M.D., University of North Carolina at Chapel Hill, 1969

J. C. FRANCO, M.D., National University Asuncion, Paraguay, 1954

O. E. IGLESIAS, M.D., University of Havana, Cuba, 1943

R. M. GAY, M.D., Tulane University, 1963

M.-C. MARROUM-KARDOUS, M.D., St. Josephs University, Lebanon, 1968

S. L. ORR, M.D., Medical University of South Carolina, 1968

T. VAITHIANATHAN, M.D., University of Ceylon, 1958

## ADJUNCT PROFESSORS

F. J. DE SERRES, Ph.D., Yale University, 1955

L. GOLBERG, M.B., B. Chir., University College Medical School, England, 1951

R. A. GOYER, M.D., St. Louis University, 1955

H. MALLING, Ph.D., University of Copenhagen, Denmark, 1957

P. NETTESHEIM, M.D., Medical School-Bonn, West Germany, 1959

J. A. SWENBERG, D.V.M., University of Minnesota, 1966

## ADJUNCT ASSISTANT PROFESSORS

J. C. BARRETT, Ph.D., Johns Hopkins University, 1974

G. A. BOORMAN, D.V.M., University of Minnesota, 1967

## ADJUNCT ASSOCIATE PROFESSORS

R. C. BROWN, M.D., University of North Carolina at Chapel Hill, 1959

B. A. FOWLER, Ph.D., University of Oregon, 1972

B. W. GLICKMAN, Ph.D. Leiden University, The Netherlands, 1973

M. A. RESNICK, Ph.D., University of California at Berkeley, 1968

## ADJUNCT INSTRUCTOR

M. J. MASS, Ph.D., University of North Carolina at Chapel Hill, 1980

## RESEARCH PROFESSOR

J. HIGGINSON, M.D., University of Dublin, Ireland, 1961

## RESEARCH ASSOCIATE PROFESSORS

J. EDWARDS, Ph.D., University of Alabama, 1976

G. Y. GILLESPIE, Ph.D., University of Mississippi, 1971

## RESEARCH ASSISTANT PROFESSORS

C. R. BAGNELL, Ph.D., Washington State University, 1974

M. CORDEIRO-STONE, Ph.D., University of Sao Paulo, Brazil, 1976

C.-J. EDGELL, Ph.D., Pittsburgh University, 1974

S. T. LORD, Ph.D., Cornell University, 1977

K. B. PRYZWANSKY, Ph.D., University of North Carolina at Chapel Hill, 1978

G. J. SMITH, Ph.D., North Carolina State University, 1975

## RESEARCH INSTRUCTOR

W. K. KAUFMANN, Ph.D., University of North Carolina at Chapel Hill, 1979

## POSTDOCTORAL FELLOWS

R. Cattley, D.V.M.; B. B. Chou, Ph.D.; C. Hipp, M.D.; K. G. Nelson, Ph.D.; D. Novicki, Ph.D.; R. J. Rahija, D.V.M.; S. A. Schichman, M.D., Ph.D.; M. S. Tsao, M.D.

## CURRICULUM

*Courses for Undergraduate Students, Suitably Qualified Graduate Students, and Health Professionals other than Medical Students*

52. CLINICAL PATHOLOGY (3 semester hours). Prerequisites: general chemistry and one course in zoology. An introductory course in the basic principles of human disease. Hematopathology, clinical chemistry, pathophysiology, diagnostic cytopathology, and clinical microbiology will be emphasized. *2 lecture and 2 laboratory hours a week. Spring, alternate years.* Staff.

90. PATHOLOGY FOR PHYSICAL THERAPY STUDENTS (3). Prerequisites: anatomy, histology, and physiology. A series of lectures and demonstrations of pathologic processes. Required of all Physical Therapy students. *Fall.* Staff.

140. INTRODUCTION TO CHEMICAL PATHOLOGY (Biochemistry 140) (3). Prerequisite: biochemistry (graduate or undergraduate), permission of instructor. Introduction to chemical pathology including the biochemical basis, methods of analysis, and clinical applications of biochemical tests. Topics may include enzymology, endocrinology, clinical toxicology-pharmacology, immunochemistry, or other selected areas. *3 lecture hours a week. Spring. (1985 and alternate years).* Chapman, Silverman, Cross, Hammond, Forman.

150. TOXIC CELL INJURY (Toxicology 150) (2). Prerequisite: Path 161s or Physiology 140 or Biochemistry 100 or Biochemistry 105, permission of instructor. Cell injury by toxins (heavy metals, chlorinated organic compounds) after acute and chronic exposure. Emphasizes detection of early ultrastructural changes in cell organelles to elucidate mechanisms of toxicity. *1 lecture, 1 seminar hour per week. Spring. (1984 and alternate years).* Fowler.

170. GENERAL SYSTEMIC AND CLINICAL PATHOLOGY (2). A consideration of the nature of disease from a number of aspects, emphasizing particularly the chemical, physiologic and genetic as well as the morphologic. Required of all second year dental students as part of Oral Medicine 120. *Fall.* Staff.

171. GENERAL SYSTEMIC AND CLINICAL PATHOLOGY (4). Prerequisite: Pathology 170. A consideration of the nature of disease from a number of aspects, emphasizing particularly the chemical, physiologic and genetic as well as the morphologic. Required of all second year dental students as part of Oral Medicine 120. *Spring.* Staff.

220. NEUROPATHOLOGY (Neurobiology 220) (5). Prerequisite: Pathology 161s and permission of instructor. Systematic study of the more common diseases of the nervous system, utilizing a gross specimen collection, a microscopic slide set, current autopsy and surgical specimens, and histochemical laboratory. *2 conference and 6 laboratory hours a week. Spring and summer.* Krigman and staff.

221. HEMATOPATHOLOGY (4). Prerequisite: Pathology 161s. A tutorial course to introduce the advanced student to techniques and problems of disorders of the blood. This will cover many aspects of immunohematology, disorders of erythrocytes, disorders of leukocytes, and bone marrow studies. *2 conference and 6 laboratory hours a week. Fall.* Staff.

### *Course Offered for Special Students in Pathology*

162. EXPERIMENTAL PATHOLOGY. Prerequisites: Physiology and biochemistry. This course is designed for students interested in the study of experimentally produced pathological states. *Hours, credits and instructor to be arranged.*

*Courses for Graduate Students*

107. INTRODUCTION TO NEUROBIOLOGY (Biochemistry 107, Neurobiology 107, Pharmacology 107, Physiology 107) (3). Prerequisites: one course in the biological sciences and permission of the Director of the Neurobiology Curriculum. This is an interdisciplinary course to provide students with an integrative view of modern concepts of neurobiology pertinent to behavior and mental disease. Topics to be considered are: organization of the nervous system, neurochemistry; neurophysiology; neuropharmacology; neurogenetics; computers, etc. *3 lecture hours a week. Fall.* (1984 and alternate years). Staff of Neurobiology Curriculum.

163. ELECTRON MICROSCOPY (4). Prerequisite: permission of instructor. Theoretical and practical aspects of electron microscopy. Application of transmission and scanning electron microscopy to pathology, with emphasis on ultra-structure of cells and organelles. *2 lecture and 6 laboratory hours a week, alternate years.* Staff.

166. MOLECULAR BIOLOGY OF BLOOD COAGULATION (3). Prerequisite: Biochemistry 100 or 105, or permission of instructor. A comprehensive presentation of the chemistry and molecular biology of the blood coagulation mechanism including consideration of component proteins, lipids, cofactors, interaction with other hemeostatic systems, and control. *3 lectures a week. Fall.* (1985 and alternate years). Staff.

169. INTRODUCTION TO HUMAN IMMUNOGENETICS (Genetics 169) (3). Prerequisite: permission of the instructor. A seminar course using immunological techniques to familiarize participants with genetic systems defined in humans. Includes discussion of methodology and its application to problems of interest to participants. *3 lectures a week. Fall. (1984 and alternate years).* Staff.

180. DNA AND CELL PATHOLOGY. (Genetics 180) (Biochemistry 180) (3). Prerequisite: Biochemistry 100 and permission of instructor. The basic chemistry of DNA and its associated structural and replicative proteins as it relates to mechanisms of mutagenesis and carcinogenesis. *3 lecture hours a week. Spring. (1985 and alternate years).* Staff.

213. PATHOLOGY FOR GRADUATE STUDENTS (5). Prerequisite: Pathology 161s or 170 and permission of the instructor. A tutorial course in human pathology. *2 seminar and 6 laboratory hours a week. Fall and spring.* Staff.

214. ETIOLOGY AND PATHOGENESIS OF HUMAN DISEASE (3). Prerequisite: permission of instructor. A tutorial course covering topics such as cell injury, cell death, tissue inflammation, necrosis, repair, and carcinogenesis. Covers basic aspects of pathology in greater depth than Pathology 161s. *2 lecture and 1 seminar hours a week.* Staff.

216. MODELS AND METHODS IN EXPERIMENTAL PATHOLOGY (3). Prerequisite: permission of instructor. An introduction to the use of *in vivo* and *in vitro* models in the study of disease. Special methods such as tissue culture, cell fractionation, and immunochemical procedures will be considered. *2 lecture and 1 seminar hours a week. Fall.* Staff.

223. SPECIAL METHODS IN PATHOLOGY (5). Prerequisite: permission of the instructor. Conducted on a tutorial basis, with the aim of providing experience with specialized techniques including histochemistry, electron microscopy, fluorescent and phase microscopy, chromatography, electrophoresis, and ultracentrifugation. *2 conference and 6 laboratory hours a week. Spring.* Staff.

228. ADVANCED TOPICS IN PROTEIN CHEMISTRY (Biochemistry 228) (3). Prerequisite: Biochemistry 100 or equivalent. Chemical approaches to the elucidation of simple and complex proteins. Special topics will include normal and abnormal hemoglobins, proteins involved in biological matrices and glycoproteins. *3 lecture hours a week. Spring.* Staff.

241. SPECIAL TOPICS IN GENETICS (Genetics 241). (2). Prerequisite: permission of the instructor. Introduction to human immunogenetics. *2 lecture hours a week. Spring.* (1984 and alternate years). Staff of Genetics Curriculum.

275. GENETICS SYSTEMS (Genetics 275, Biochemistry 275, Biology 275, Pathology 275). (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. *Fall.* (1984–1985 and alternate years). Staff of the Genetics Curriculum.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290, Neurobiology 290, Pharmacology 290, Physiology 290, Zoology 290) (3). Prerequisites: one graduate course in the biological sciences and permission of the Director of the Neurobiology Curriculum. An integrative consideration of selected topics and problems associated with the nervous system and behavior. *3 lecture hours a week. Fall and spring.* Staff of Neurobiology Curriculum.

291. SEMINAR IN BLOOD COAGULATION (2). Prerequisite: Pathology 166 or permission of the instructor. An in-depth analysis of the current state-of-art in hemostasis research with emphasis on the molecular pathology of the clotting factors, fibrinolytic system, and platelet function. *2 lecture hours a week. Fall and Spring.* Staff.

292. SEMINAR IN CARCINOGENESIS (2). Prerequisite: permission of the instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. *2 seminar hours a week. Fall.* (1984 and alternate years). Staff.

301. SEMINAR IN PATHOLOGY (2). Prerequisite: Pathology 161s. This course consists of seminars designed to acquaint the student with recent literature in pathology, particularly as it relates to research activities carried on within the Department. *3 hours a week, to be arranged.* Staff.

302, 303, 304. RESEARCH IN PATHOLOGY (3 or more hours). These courses are designed to give advanced students in pathology an opportunity to carry on investigations on the mechanism of disease. Current research programs deal with blood coagulation, hemorrhagic diathesis, thrombosis, cold injury, human genetics, pulmonary pathology, chemical carcinogenesis, hepatic injury and recovery, and immunohematology. *10 or more laboratory hours a week.* Staff.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Neurobiology 310, Pharmacology 310, Physiology 310, Zoology 310) (3–12). Prerequisites: permission of a staff member and the Director of Neurobiology Curriculum. Research in various aspects of neurobiology. *6-24 hours a week. Fall and spring.* Staff of Neurobiology Curriculum.

393. MASTER'S THESIS (3–6). *Fall and spring.* Staff.

394. DOCTORAL DISSERTATION (3 or more). *Fall and spring.* Staff.

400. GENERAL REGISTRATION (0).

# *The Department of Pediatrics*

The principal activities of the Department of Pediatrics fall into three major categories: patient care, education, and research. Areas of interest for all of these activities include maintenance of health in well children, growth and development, psychosocial aspects of child care, and a full range of pathophysiologic processes that produce developmental disabilities and illness in children and adolescents. Patient care and teaching efforts are centered in both the inpatient and ambulatory settings of the hospital. Outreach programs link the program of the Department of Pediatrics with practicing physicians in the area, schools, and a wide variety of other child care programs. Major components of the department are located at North Carolina Memorial Hospital in Chapel Hill, Wake Hospital in Raleigh, Moses Cone Hospital in Greensboro, and Charlotte Memorial Hospital in Charlotte.

## PROFESSORS

T. F. BOAT (Chair), M.D., University of Iowa, 1966

H. R. CHAMBERLIN, M.D., Harvard University, 1945

W. A. CLYDE, Jr., M.D., Vanderbilt University, 1954

A. M. COLLIER, M.D., University of Miami, 1963

F. W. DENNY, Jr. (Alumni Distinguished Professor of Pediatrics), M.D., Vanderbilt University, 1946

D. DUNPHY, M.D., Yale University, 1944

G. W. FERNALD, M.D., University of North Carolina at Chapel Hill, 1960

F. S. FRENCH, M.D., University of Rochester, 1956

H. S. HARNED, Jr., M.D., Yale University, 1945

H. N. KIRKMAN (Kenan Professor of Pediatrics), M.D., Johns Hopkins University, 1952

E. N. KRAYBILL, M.D., University of Pennsylvania, 1962

F. A. LODA, Jr., M.D., Vanderbilt University, 1960

C. W. MCMILLAN, M.D., Wake Forest University, 1952

C. A. MILLER, M.D., Yale University, 1948

M. K. SHARPLESS, M.D., University of North Carolina at Chapel Hill, 1959

D. A. SILBER, Jr., M.D., Vanderbilt University, 1957

L. E. UNDERWOOD, M.D., Vanderbilt University, 1961

J. J. VAN WYK (Kenan Professor of Pediatrics), M.D., Johns Hopkins University, 1948

## ASSOCIATE PROFESSORS

A. S. AYLSWORTH, M.D., University of Pennsylvania, 1967

P. W. CHENG, Ph.D., Case Western Reserve University, 1974

H. A. COOPER, M.D., University of Kansas, 1964

A. J. D'ERCOLE, M.D., Georgetown University, 1969

M. F. DURFEE, M.D., University of Vermont, 1963

R. A. GREENBERG, M.D., University of Pennsylvania, 1964

W. B. GREENE, M.D., University of North Carolina at Chapel Hill, 1972

R. S. GREENWOOD, M.D., University of Texas at Galveston, 1968

H. J. HAMRICK, M.D., University of North Carolina at Chapel Hill, 1967

F. W. HENDERSON, M.D., University of North Carolina at Chapel Hill, 1970

R. T. HERRINGTON, M.D., University of Washington, 1957

D. L. INGRAM, M.D., Yale University, 1967

E. E. LAWSON, M.D., Northwestern University, 1972

J. MANDELL, M.D., University of Florida, 1970

C. R. MORRIS, M.D., Baylor University, 1962

S. A. SCHALL, M.D., University of Pennsylvania, 1964

B. STABLER, Ph.D., University of North Carolina at Chapel Hill, 1971

C. A. TAYLOR, M.D., University of Tennessee, 1957

. D. THULLEN, D. O., College of Osteopathic Medicine and Surgery, 1970

M. H. ULSHEN, M.D., University of Rochester, 1969

R. L. VAUGHAN, M.D., University of North Carolina at Chapel Hill, 1970

E. M. WILSON, Ph.D., Vanderbilt University, 975

R. E. WOOD, Ph.D., M.D., Vanderbilt University, ity, 1968, 1970

## ASSISTANT PROFESSORS

C. L. BOSE, M.D., Emory University, 1974

A. W. CROSS, M.D., Columbia University, 1970

R. FALK, Ph.D., University of Michigan, 1963

M. G. FOWLER, M.D., University of Oregon, 972

V. J. HEBBERT (Emeritus), M.S., Columbia University, 1941

G. W. HENRY, M.D., University of North Carolina at Chapel Hill, 1977

D. K. RUNYAN, M.D., University of Minnesota, 1976

M. C. SHARP, M.D., Harvard University, 1974

M. D. SHUB, M.D., University of Vermont, 1976

G. L. STROPE, M.D., University of Rochester, 1974

S. W. TEPLIN, M.D., University of Pennsylvania, 1973

R. W. WARREN, M.D., Ph.D. Washington University, 1978

R. J. WELLS, M.D., University of California at San Diego, 1975

S. T. WHITE, M.D., University of North Carolina at Chapel Hill, 1975

J. K. WHITT, Ph.D., University of Texas, 1977

## INSTRUCTORS

M. M. HENRY, M.D., University of North Carolina at Chapel Hill, 1977

M. B. TENNISON, M.D., Harvard University, 1975

## CLINICAL PROFESSORS

R. C. BROWNLEE, M.D., Vanderbilt University, 1945

S. S. CHIPMAN (Emeritus), M.D., McGill University, 1928

B. L. GALUSHA, M.D., Case Western Reserve University, 1952

W. H. GRONEMEYER, M.D., Case Western Reserve University, 1935

K. J. LEVIN, M.D., University of Vermont, 1961

H. MEYER, M.D., Jefferson Medical College, 1946

S. T. MORROW, M.D., University of Maryland, 1944

J. C. PARKE, M.D., University of North Carolina at Chapel Hill, 1954

L. PENSLER, M.D., Wayne State University, 1942

F. R. REYNOLDS, M.D., University of Pennsylvania, 1944

C. S. SCHROEDER, Ph.D., University of Pittsburgh, 1966

C. I. SHEAFFER, M.D., University of Virginia, 1958

E. SIEGEL, M.D., New York Medical College, 1948

E. A. SUMPTER, M.D., University of Virginia, 1956

## CLINICAL ASSOCIATE PROFESSORS

W. A. ARCHER, M.D., University of North Carolina at Chapel Hill, 1966

E. P. BENBOW (Emeritus), M.D., Duke University, 1941

H. D. BRUTON, M.D., University of North Carolina at Chapel Hill, 1961

E. B. COLEY, M.D., University of Pennsylvania, 1952

W. G. CONLEY III, M.D., University of Virginia, 1960

G. C. DICKSON, M.D., University of North Carolina at Chapel Hill, 1955

R. M. DOUGHTEN, M.D., University of North Carolina at Chapel Hill, 1965

P. B. FOLLO, M.D., Harvard University, 1947

E. L. FORD (Emeritus), M.D., University of Pennsylvania, 1943

T. A. HENSON (Emeritus), M.D., Temple University, 1947

C. M. HICKS, M.D., University of North Carolina at Chapel Hill, 1962

W. C. HUBBARD, M.D., University of North Carolina at Chapel Hill, 1966

R. D. KENNEY, M.D., Georgetown University, 1967

F. X. C. KNOBELOCH, Ph.D., University of Florida, 1959

H. C. LANE, M.D., Duke University, 1953

W. L. LONDON, M.D., University of North Carolina at Chapel Hill, 1955

J. F. LYNCH, Jr., M.D., Jefferson Medical College, 1944

D. M. MACQUEEN, M.D., University of North Carolina at Chapel Hill, 1969

M. E. PIZER, M.D., University of Louisville, 1947

M. A. RATHBUN, M.D., Albany Medical College and Union University, 1970

S. D. RAVENEL, M.D., Duke University, 1964

A. S. RUBIN (Emeritus), M.D., New York University, 1937

R. P. SCHWARTZ, M.D., University of Florida, 1968

J. W. SINGER, M.D., Ohio State University, 1961

D. D. SMITH, M.D., Duke University, 1960

H. B. SPANGLER, M.D., Wake Forest University, 1948

W. C. STEWART, M.D., University of Pennsylvania, 1946

G. K. SUMMER, M.D., Harvard University, 1951

C. H. WEATHERLY, M.D., Duke University, 1949

R. L. WEAVER, M.D., University of Florida, 1968

J. W. WHATLEY, M.D., Duke University, 1959

J. K. WHISNANT, M.D., Wake Forest University, 1968

T. E. WILLIAMS, M.D., University of Texas at Dallas, 1962

## CLINICAL ASSISTANT PROFESSORS

J. S. ATWATER, Jr., M.D., Medical College of Georgia, 1970

G. L. AUMAN, M.D., Wake Forest University, 1968

J. A. BARDELES, Jr., M.D., Johns Hopkins University, 1973

J. C. BERNSTEIN, M.D., University of North Carolina at Chapel Hill, 1970

H. R. BOER, M.D., University of Ottawa, Canada, 1968

C. B. BRETT, M.D., University of North Carolina at Chapel Hill, 1971

W. D. BROWN, M.D., University of Rochester, 1968

W. A. BRYAN III, M.D., Loma Linda University, 1968

W. B. BRYAN, M.D., Duke University, 1956

F. D. BURROUGHS, M.D., Meharry Medical College, 1966

H. C. CANNON, M.D., Women's Medical College of Pennsylvania, 1967

D. D. CARMICHAEL, M.D., Aberdeen University, Scotland, 1950

D. T. CASTO, Pharm.D., University of Texas at Austin, 1980

A. E. CATO, M.D., Duke University, 1969

R. S. CHAPMAN, M.D., Harvard University, 1971

R. M. CHRISTIAN, M.D., Case Western Reserve University, 1967

D. G. COLEMAN, M.D., Medical College of South Carolina, 1975

A. D. COLLINS, M.D., University of Texas, 1977

B. B. COMPTON, F.N.P., University of North Carolina at Chapel Hill, 1971

J. C. COUNCIL, Jr., M.D., University of North Carolina at Chapel Hill, 1961

S. P. DAWSON, M.D., George Washington University, 1955

J. FISCHER, M.D., University of Illinois, 1974

J. M. FOY, M.D., University of North Carolina at Chapel Hill, 1971

E. R. FRANKLIN, M.D., University of North Carolina at Chapel Hill, 1973

J. M. GAZAK, M.D., University of Pennsylvania, 1974

B. L. GOLEMBE, M.D., University of Virginia, 1974

F. S. GRASS, Ph.D., University of Illinois, 1971

J. P. HAMILTON, M.D., University of Pennsylvania, 1958

H. C. HAWTHORNE, M.D., University of Virginia, 1967

D. E. HICKEY, M.D., Wake Forest University, 1975

E. C. HOLSCHER, M.D., University of Missouri, 1965

O. HUFF, M.D., University of Louisville, 1962

R. D. JACKSON, M.D., University of Pennsylvania, 1966

P. J. JAROSAK, M.D., University of Minnesota, 1972

M. P. JOHNSON, M.S.N., Duke University, 1980

. G. JOHNSTON, M.D., University of North Carolina at Chapel Hill, 1969

. G. KAHLER, M.D., Duke University, 1973

R. E. KEENEY, M.D., University of Missouri, 1968

. T. KLIMAS, M.D., New York University, 1973

). W. KREDICH, M.D., University of Michigan at Ann Arbor, 1962

C. F. LAFORCE, M.D., Jefferson Medical College, 1975

D. LEFKOWITZ, M.D., Tulane University, 1965

J. S. LESSER, M.D., Medical University of South Carolina, 1967

R. H. LEVINE, M.D., State University of New York–Downstate, 1959

E. W. LITTLE, M.D., University of North Carolina at Chapel Hill, 1971

H. W. MCKAY, M.D., Johns Hopkins University, 1955

C. F. MARSHALL, Jr., M.D., University of South Carolina, 1969

E. S. MARTIN, M.D., University of Pennsylvania, 1969

R. B. MAY, M.D., University of Pennsylvania, 1973

D. H. MOORE, M.D., Indiana University, 1976

R. B. MOORE, M.D., Cornell University, 1952

J. F. MORRIS, M.D., University of Louisville, 1952

D. MORTON, M.D., University of North Carolina at Chapel Hill, 1966

E. G. PATTISHALL, M.D., Case Western Reserve University, 1975

P. D. PENDSE, M.D., Bombay University, India, 1960

C. A. PETERSEN, M.D., Medical College of Georgia, 1976

F. E. RECTOR, M.D., Wayne State University, 1969

M. C. REESE, M.D., University of Virginia, 1977

W. A. ROBIE, M.D., George Washington University, 1942

O. F. RODDEY, Jr., M.D., University of North Carolina at Chapel Hill, 1955

D. M. RUBIN, M.D., University of North Carolina at Chapel Hill, 1968

K. E. SALTER, M.D., University of Pittsburgh, 1970

T. P. SALTER, M.D., University of North Carolina at Chapel Hill, 1975

R. W. SCHAFERMEYER, M.D., University of Missouri, 1973

E. L. SCHILLER, M.D., Vanderbilt University, 1974

H. D. SCHUTTE, M.D., Loma Linda University, 1962

J. E. SCHWANKL, M.D., University of Minnesota, 1969

F. S. SHAW, M.D., University of Pennsylvania, 1959

J. SHAW, M.D., University of Texas at Galveston, 1975

H. L. SMITH, M.D., University of Pennsylvania, 1966

A. I. SNITZ, M.D., University of Virginia, 1975

M. S. SNYDER, M.D., Ohio State University, 1974

M. W. STALLINGS, M.D., University of Alabama, 1969

M. H. SUGIOKA, M.D., Duke University, 1963

M. E. SWANSON, M.D., University of Colorado, 1975

M. A. TAYLOR, M.D., University of Louisville, 1976

J. M. TODD, M.S., Case Western Reserve University, 1957

V. E. VISSER, M.D., University of Iowa, 1973

D. K. WAGONER, M.D., University of North Carolina at Chapel Hill, 1971

C. E. WARNER, M.D., Duke University, 1958

O. J. WELLS, M.D., Medical College of Georgia, 1977

W. E. WHITE, M.D., Wake Forest University, 1946

W. T. WILLIAMS, Jr., M.D., Baylor University, 1973

S. WONG, M.D., University of Malaya, 1973

## CLINICAL INSTRUCTORS

D. W. BADGER, M.S.W., University of West Virginia, 1978

C. H. BARRETT, M.P.H., Tulane University, 1977

N. P. CALLANAN, M.S., Sarah Lawrence College, 1977

W. H. CRAFT, M.D., University of North Carolina at Chapel Hill, 1979

R. D. IFFT, M.S., University of California at Berkeley, 1980

P. B. JACKSON, F.N.P., University of North Carolina at Chapel Hill, 1976

A. E. KNOX, M.D., University of Santo Thomas, 1959

J. L. LAIL, M.D., University of Kentucky, 1978

M. M. LAURIA, M.S.W., University of North Carolina at Chapel Hill, 1974

P. A. MAGYARI, M.S., Sarah Lawrence College, 1981

C. T. MARSTON, Jr., M.D., East Carolina University, 1978

M. M. MCLEOD (Emeritus), M.D., Vanderbilt University, 1935

P. J. MORRIS, M.D., University of North Carolina at Chapel Hill, 1978

W. C. POWELL, M.D., Wake Forest University, 1952

S. M. SPINOLA, M.D., Georgetown University, 1978

## RESEARCH ASSOCIATE PROFESSORS

J. C. COFFEY, Jr., Ph.D., University of North Carolina at Chapel Hill, 1970

P. HU, Ph.D., University of Michigan, 1973

## RESEARCH ASSISTANT PROFESSORS

J. L. CARSON, Ph.D., University of North Carolina at Chapel Hill, 1975

W. A. LONG, M.D., University of North Carolina at Chapel Hill, 1976

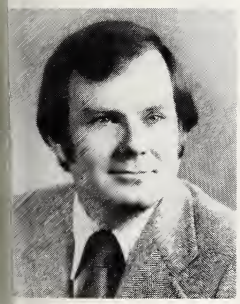
## RESEARCH INSTRUCTOR

D. W. BUTZIN, M.B.A., Drexel University, 1974

# The Department of Pharmacology

The Department of Pharmacology offers a program of study that leads to the degree of Doctor of Philosophy. The basic course requirements for the degree include introductory and advanced courses in pharmacology and courses in related sciences in accord with the principal area of interest of the student. In addition, the student must pass an examination or courses in a foreign language, pass written and oral doctoral examinations, write a dissertation which is based on original research, and submit to a final oral examination.

Faculty research interests which serve as areas for dissertation research include drug receptor interaction, drug metabolism, mechanisms of drug toxicity and study of the mechanism of action of drugs affecting the cardiovascular, endocrine and nervous systems, as well as drugs used as chemotherapeutic agents in the treatment of malignant and viral diseases. Problems related to the mechanisms of ion transport, and regulation of drug receptor synthesis, gene expression and cell growth all are being studied with modern techniques of cellular and molecular biology. Students are expected to begin independent research early in their training and to participate in an intensive program of research seminars.



The department also provides specific courses for students in the health professions which teach the principles of pharmacology as the basis for rational therapeutics. Students in the health profession schools also are encouraged to enroll in one or more of a wide variety of departmental course offerings designed to serve as electives.

## ROFESSORS

P. PERKINS (Chair), Ph.D., Yale University, )66

. R. BREESE, Ph.D., University of Tennessee, )65

C. BUTLER (Emeritus), M.D., Vanderbilt Uni-rsity, 1934

C. CHENG, Ph.D., Brown University, 1972

. H. DUDLEY, Ph.D., University of North Caro-ıa at Chapel Hill, 1963

W. ELLIS (Emeritus), Ph.D., University of aryland, 1941

J. T. GATZY, Ph.D., University of Rochester, 1963

T. K. GRAY, M.D., University of Maryland, 1965

P. F. HIRSCH, Ph.D., University of California at Berkeley, 1954

T. S. MIYA, Ph.D., Purdue University, 1952

R. A. MUELLER, M.D., Ph.D., University of Minnesota, 1965, 1966

P. L. MUNSON (Sarah Graham Kenan Emeritus Professor of Pharmacology and Endocrinology), Ph.D., University of Chicago, 1942

R. D. MYERS, Ph.D., Purdue University, 1956

D. A. ONTJES, M.D., Harvard University, 1964

W. H. PEARLMAN (Emeritus), Ph.D., Columbia University, 1940

G. A. SCARBOROUGH, Ph.D., University of California at Los Angeles, 1966

B. J. STOVER, Ph.D., University of California at Berkeley, 1950

W. E. STUMPF, M.D., Humboldt University, East Germany, 1952

R. V. TALMAGE, Ph.D., Harvard University, 1947

R. G. THURMAN, Ph.D., University of Illinois, 1967

S. U. TOVERUD, D.M.D., Harvard University, 1954; Dr. Odont., University of Oslo, 1964

## ASSOCIATE PROFESSORS

H. J. BURFORD, Ph.D., University of Kansas, 1962

L. X. CUBEDDU, M.D., Central University, Venezuela, 1964; Ph.D., University of Colorado, 1974

R. J. DINGLEDINE, Ph.D., Stanford University, 1975

L. A. DYKSTRA-HYLANDER, Ph.D., University of Chicago, 1972

B. GOZ, Ph.D., State University of New York-Downstate, 1965

T. K. HARDEN, Ph.D., University of Mississippi, 1974

C. HARPER, Ph.D., University of Missouri, 1969

J. S. KIZER, M.D., Duke University, 1970

T. C. PENG, M.D., University of Geneva, Switzerland, 1959

W. J. PLEDGER, Ph.D., Purdue University, 1972

D. T. POOLE, Ph.D., University of North Carolina at Chapel Hill, 1962

J. R. POWELL, Pharm.D., Philadelphia College of Pharmacy and Science, 1973

M. H. RAJ, Ph.D., Indian Institute of Science, India, 1969

J. F. ROGERS, M.D., University of Maryland, 1967

## ASSISTANT PROFESSORS

R. CORONADO, Ph.D., Brandeis University, 1980

R. KOLE, Ph.D., University of Warsaw, Poland, 1976

K. D. MCCARTHY, Ph.D., University of Utah, 1975

B. S. PALLOTTA, Ph.D., University of Vermont, 1978

B. L. SLIFER, Ph.D., University of Wyoming, 1980

## RESEARCH ASSOCIATE PROFESSORS

P. L. CARL, Ph.D., University of California at Berkeley, 1968

R. B. MAILMAN, Ph.D., North Carolina State University, 1974

## RESEARCH ASSISTANT PROFESSORS

R. ADDISON, Ph.D., Cornell University, 1977

G. E. LESTER, Ph.D., Medical College of Virginia, 1977

## ADJUNCT PROFESSORS

C. F. CHIGNELL, Ph.D., University of London England, 1962

P. CUATRECASAS, M.D., Washington University, 1962

G. B. ELION, D.M.S., Brown University, 1969

J. R. FOUTS, Ph.D., Northwestern University 1954

L. GOLBERG, D.Phil., Oxford University, England, 1939; M.D., Cambridge University, England, 1951

G. H. HITCHINGS (Emeritus), Ph.D., Harvard University, 1933

R. A. MAXWELL, Ph.D., Princeton University 1954

C. L. MITCHELL, Ph.D., University of Iowa 1959

C. A. NICHOL, Ph.D., University of Wisconsin 1949

D. P. RALL, M.D., Ph.D., Northwestern University, 1951

## ADJUNCT ASSOCIATE PROFESSORS

S. C. BONDY, Ph.D., University of Birminghar England, 1962

. J. DILIBERTO, Ph.D., University of Rochester, 972

.. H. LAZARUS, Ph.D., University of California t Los Angeles, 1966

). J. NELSON, Ph.D., Yale University, 1965

. SPECTOR, Ph.D., Yale University, 1970

. A. SPILKER, Ph.D., State University of New ork-Downstate, 1967; M.D., University of Mimi, 1977

## DJUNCT ASSISTANT PROFESSORS

. R. COOPER, Ph.D., Purdue University, 1971

. W. REITER, Ph.D., University of Kansas, 1970

## VISITING SCHOLARS

Y.-R. Wu; C. G. Hertel

## POSTDOCTORAL RESEARCH ASSOCIATES

A. Ando; K. H. Bastow; J. Bouchard; J. F. Chiou; K. C. DesJardins; A. Doble; B. H. Dulis; T. Evans; K. B. Frank; F. S. Han; P. A. Johnston; N. R. Kramarcy; J. M. Leclerc; M. W. Martin; H. Meren; L. M. Nutter; M. J. Olson; P. A. Trimmer; S. P. Watson; M. Wolf.

## POSTDOCTORAL RESEARCH FELLOWS

F. W. Kari; G. L. King.

## CURRICULUM

### *Courses for Health Professionals other than Medical Students*

55, 56. GENERAL PHARMACOLOGY (3 each). Prerequisites: all preceding courses in chemistry, zoology, bacteriology, and physiology in the School of Pharmacy curriculum or their equivalent. A course for pharmacy students. General principles as they apply to the major drug classes will be stressed. *3 lecture hours a week. Fall and spring.* Dudley.

### *Courses for Undergraduate Students*

99. FUNDAMENTALS OF DRUG ACTION (3). Prerequisites: Zoology 11 and Organic Chemistry 62, or permission of instructors. A course to provide basic information on principles and mechanisms of drug action emphasizing science. Highlights of pharmacology will be covered rather than an exhaustive cataloging of drugs. *3 lecture hours a week. Spring.* Thurman; staff.

134. PHARMACOLOGY (DENT 123) (3). A course for second year students in the School of Dentistry. *2 lecture hours a week and special assignments. Fall.* Toverud and associates.

135. BIOLOGICAL SCIENCES LABORATORY (DENT 124) (3). "In-depth" laboratory experiences in pharmacology for students in the School of Dentistry. *8 laboratory and conference hours a week. Fall and spring.* Toverud and associates.

### *Courses for Suitably Qualified Undergraduates and Graduate Students*

105. TECHNIQUES IN MOLECULAR ENDOCRINOLOGY (2). Prerequisites: Biochemistry 100L, 105, or equivalent and permission of the instructor. A guide to techniques for the estimation of hormones in tissues, hormone-protein interactions, isolation and characterization of hormones and hormone-binding proteins, and hormone dynamics. *2 lecture hours a week. Fall.* Staff.

106. CURRENT CONCEPTS IN MOLECULAR ENDOCRINOLOGY (2). Prerequisites: Biochemistry 100 or equivalent, and permission of the instructor. Recent re-

search in chemical endocrinology bearing on the biology of reproduction, normal growth and development, and cancer; mechanisms of hormone action and other topics. *2 lecture hours a week. Fall.* Staff.

110. TECHNIQUES IN PHYSIOLOGICAL PHARMACOLOGY (3). Prerequisites: Pharmacology 202 and permission of instructor. Students will learn and perform a variety of physiological techniques often used in classical pharmacological research. *1 lecture and 6 laboratory hours a week. Spring.* (1984 and alternate years). Staff.

118. NEUROENDOCRINOLOGY (Anatomy 118) (2). Prerequisite: permission of the instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. Emphasis on endocrine functions as related to neuropharmacology, behavior, consolidation of memory, psychopathology, neurophysiology and neuroanatomy. *2 lecture hours a week. Spring.* (1984 and alternate years). Stumpf.

123. BEHAVIORAL PHARMACOLOGY (Neurobiology 123, Psychology 123) (3). Prerequisites: Pharmacology 202, or Psychology 101 and 106, or their equivalent. Basic principles of pharmacology and the experimental analysis of animal behavior will be considered in relation to drugs that affect the central nervous system. *3 lecture hours a week. Spring.* (1985 and alternate years). Staff.

### *Courses Offered for Graduate Students*

201. BASIC PRINCIPLES OF PHARMACOLOGY (1). Prerequisite: permission of the instructor. Dose-effect relationships and the concept, kinetics, isolation and indentification of receptors. *1 lecture hour a week. Fall.* Perkins.

202. PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Toxicology 202) (5). Prerequisites: Biochemistry 100 and Physiology 140, or their equivalents and permission of the instructor. Introduces the major areas of pharmacology and toxicology and serves as a basis for more advanced courses such as Pharmacology 203 or 204. *5 lecture hours a week. Spring.* Goz; associates.

203. SYNAPTIC PHARMACOLOGY (Neurobiology 203) (3). Prerequisite: Pharmacology 202 or permission of the instructor. An in-depth consideration of biochemical and physiological bases for actions of neuroactive drugs and their possible sites of action in terms of identified pathways and synapses in the brain. *3 lecture hours a week. Fall.* Dingledine, Harden, McCarthy.

204. CARDIOVASCULAR AND RENAL PHARMACOLOGY (2). Prerequisites: Pharmacology 202 and permission of the instructor. Recent advances in the elucidation of the mechanisms by which cardiotonic, antidysrhythmic and diuretic agents alter cardiac and renal function. *2 lecture hours a week. Spring.* Poole; associates.

205. INHIBITORS OF NUCLEIC ACID AND PROTEIN METABOLISM: MECHANISMS AND APPLICATIONS (2). Prerequisites: Pharmacology 202 and permission of the instructor. The mechanisms of action of inhibitors of nucleic acid and protein metabolism and how they may be used to further understanding of cellular replicatory processes, antibacterial, antiviral and anticancer chemotherapy. *2 lecture hours a week. Fall.* Goz.

206. PHARMACOLOGY OF HORMONES AND VITAMINS AFFECTING MINERAL HOMEOSTASIS AND BONE METABOLISM (2). Prerequisites: Pharmacology 202 and permission of the instructor. Concepts and current research concerning the roles of parathyroid hormone, calcitonin, steroid hormones and vitamins A, C, and D

in calcium homeostasis and bone mineral metabolism. *2 lecture hours a week. Spring.* Toverud.

207. RECENT ADVANCES IN TOXICOLOGY (Toxicology 207) (2). Prerequisites: Pharmacology 202 and permission of the instructor. Recent advances in teratogenesis, mutagenesis, cardio-, hepato-, and pulmonary toxicology and the modes of action of toxic chemicals that are found in the environment. *2 hours a week. Fall.* Gatzy; associates.

208. CELLULAR REGULATORY MECHANISMS (2). Prerequisites: Pharmacology 202 and permission of the instructor. Recent advances in the area of cellular regulatory mechanisms, specifically, regulation of enzyme activity, protein synthesis, plasma membrane protein turnover, and cell growth. *2 lecture hours a week. Spring.* Perkins.

209. BIOTRANSFORMATION OF XENOBIOTICS (Toxicology 209) (2). Prerequisites: Biochemistry 100 or equivalent and permission of the instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active or inactive products. The importance of metabolic pathways to therapy/toxicity. *2 lecture hours a week. Fall.* Harper; associates.

211, 212. INTRODUCTION TO PHARMACOLOGY RESEARCH (4 each). A course for first-year graduate students in Pharmacology. A series of research projects of limited scope, each pursued for a 4 to 8 week period under the supervision of a different faculty member. *12 laboratory hours a week. Fall and spring.* Poole and associates.

213. INTRODUCTION TO PHARMACOLOGICAL RESEARCH (2). Prerequisites: Pharmacology 211 and 212. This is a continuation of Pharmacology 211 and 212. *6 laboratory hours a week. First summer session.* Poole.

214. INTRODUCTION TO PHARMACOLOGICAL RESEARCH (2). Prerequisites: Pharmacology 211, 212, and 213. This is a continuation of Pharmacology 211, 212, and 213. *6 laboratory hours a week. Second summer session.* Poole.

215. THE STRUCTURE AND FUNCTION OF CELL SURFACE MEMBRANES (2). Prerequisites: Biochemistry 100 or equivalent and permission of the instructor. Lecture course covering current concepts of the molecular nature of the cell plasma membrane and its components. *2 lecture hours a week. Fall.* Scarborough.

221. TUTORIAL IN PHARMACOLOGY (3 or more). Prerequisites: Pharmacology 202 or its equivalent and permission of the staff. Students will spend 4–6 week periods with selected instructors reading in depth in specialized fields of pharmacology. Oral presentations and written reports will be required. *Fall, spring and summer.* Staff.

231. THEORY OF RATE PROCESSES IN PHARMACOLOGY (3). Prerequisites: Pharmacology 202, or its equivalent, or physical chemistry, and permission of the instructor. Theory of the effects of temperature, pressure, chemical environment (including drugs), and time on biochemical and living systems. *3 lecture hours a week. Fall.* Stover.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290, Neurobiology 290, Pathology 290, Physiology 290) (3). Prerequisite: Permission of the Director of the Neurobiology Curriculum. An integrative consideration of selected topics associated with the nervous system and behavior. *Spring.* Members of the Neurobiology Program.

301. RESEARCH IN PHARMACOLOGY (5 or more). Prerequisite: permission of the staff. *Fall, spring, and summer.* Staff.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310, Neurobiology 310, Pathology 310, Physiology 310, Psychology 310, Zoology 310) (3–12). Prerequisites: permission of a staff member of the Neurobiology Curriculum. Research in various aspects of neurobiology. *6–24 hours a week. Fall and spring.* Members of the Neurobiology Program.

330. SEMINAR IN RECENT ADVANCES IN PHARMACOLOGY (1). Students will meet as a group with faculty members to summarize and discuss the important current pharmacological literature. *1 hour a week. Fall and spring.* Gatzy, Goz.

331. SEMINAR IN GENERAL PHARMACOLOGY (1). A series of weekly lecture-seminars by graduate students, faculty members and visiting scientists on current research in pharmacology. *1 hour a week. Fall and spring.* Perkins, Peng.

393. THESIS FOR MASTER'S DEGREE (3 or more). Prerequisite: permission of the staff. *Fall, spring, and summer.* Staff.

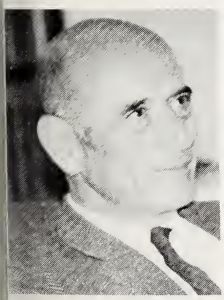
394. DOCTORAL DISSERTATION (3 or more). Prerequisite: permission of the staff. *Fall, spring and summer.* Staff.

400. GENERAL REGISTRATION (0).

# The Department of Physiology

Physiology is the branch of science dealing with the physical and chemical processes that operate in animal cells, in tissues or organs and in the body as a whole. It emphasizes mechanistic analyses of cell biology or of the function of organs and systems.

The Department of Physiology organizes and participates in courses of instruction in cellular and systemic function for students in the first and second years of the medical curriculum and provides special courses in these topics for dental and other health science professional students (nursing, pharmacy, physical therapy, radiological science). Its faculty is active in both the graduate training program and interdisciplinary graduate curricula. The department offers a graduate survey course in physiology and specialized graduate courses on a regular basis. The faculty operates vigorous research programs in cell biology (membrane function, genetic expression and molecular endocrinology), in neurobiology (cell excitability, synaptic transmission and sensory systems), in renal physiology, and in the control of respiration and cardiovascular function. The research effort is supported to a large extent by grants-in-aid from sources outside the University. Because of its focus, the Department has substantial equipment for conducting electrical, physical and chemical analyses. It also maintains electron microscopic, tissue culture, sophisticated digital computer and shop (machine, electronic) facilities. The faculty utilizes research techniques ranging from recombinant DNA probes and ultrastructural analyses to macroscopic measures. The Department of Physiology provides multiple opportunities for research by graduate, medical, and other health science professional students.



## ROFESSORS

R. PERL (Chair) (Sarah Graham Kenan Professor of Physiology), M.D., University of Illinois, 49; M.S., University of Illinois, 1951

A. COULTER, M.D., Harvard University, 50

L. ELDRIDGE, M.D., Stanford University, 48

G. FAUST, Ph.D., Princeton University, 1960

J. H. FERGUSON (Emeritus), M.D., Harvard University, 1928; D.Sci., University of Cape Town, South Africa, 1957

E. B. KOKAS (Emeritus), M.D., University of Debrecen, Hungary, 1927; Candidate of Sciences, Hungarian Academy of Sciences, 1956

A. L. FINN, M.D., Boston University, 1958

C. W. GOTTSCHALK, M.D., University of Virginia, 1945; Sc.D. (Honorary), Roanoke College, 1966

A. T. MILLER (Emeritus), M.D., Duke University, 1953; Ph.D., University of Michigan, 1939

J. H. PERLMUTT (part-time), Ph.D., Princeton University, 1950

A. RUSTIONI, M.D., Parma University, Italy, 1965

B. L. WHITSEL, Ph.D., University of Illinois, 1965

## VISITING PROFESSOR

J.-L. ADER, M.D., Paul Sabatier University, France, 1966

## ADJUNCT PROFESSORS

M. KUNO, M.D., Kyoto University, Japan, 1954; Ph.D., Kyoto University, 1960

J. W. MOORE, Ph.D., University of Virginia, 1945

C. J. VIERCK, Jr., Ph.D., University of Florida, 1963

## ASSOCIATE PROFESSORS

W. J. ARENDSHORST, Ph.D., Indiana University, 1970

J. A. CIDLOWSKI, Ph.D., Medical College of Georgia, 1975

D. A. DREYER, Ph.D., University of Pittsburgh, 1971

P. B. FAREL, Ph.D., University of California at Los Angeles, 1957

R. L. GLASSER, Ph.D., University of Maryland, 1957

E. R. KAFER, M.D., University of Sydney, Australia, 1970; M.B., B.S., University of Sydney, 1959–62

G. M. LANGFORD, Ph.D., Illinois Institute of Technology, 1971

D. L. MCILWAIN, M.D., Washington University, 1964

G. W. D. MEISSNER, Ph.D., Technical University Berlin, Germany, 1965

G. S. OXFORD, Ph.D., Emory University, 1974

A. E. STUART, Ph.D., Yale University, 1969

J. N. WEAKLY, Ph.D., University of Utah, 1968 (on leave through 7/14/84)

L. R. YONCE, Ph.D., University of Michigan, 1955

## ADJUNCT ASSOCIATE PROFESSORS

L. MENDELL, Ph.D., Massachusetts Institute of Technology, 1965

R. RECORDATI, M.D., University of Milan, Italy, 1968

## ASSISTANT PROFESSORS

C. W. DAVIS, Ph.D., University of North Carolina at Chapel Hill, 1978

J. E. FABER, Ph.D., University of Missouri at Columbia, 1980

A. R. LIGHT, Ph.D., State University of New York at Upstate Medical Center, 1976

P. K. LUND, Ph.D., University of Newcastle upon Tyne, England, 1979

L. M. MARSHALL, Ph.D., University of California at Berkeley, 1976

D. E. MILLHORN, Ph.D., Ohio State University, 1978

R. W. SEALOCK, Ph.D., Purdue University, 1972

## RESEARCH ASSISTANT PROFESSORS

K. C. LIGHT, Ph.D., Syracuse University, 1976

N. G. MOSS, Ph.D., University College of North Wales, Wales, 1976

## VISITING ASSISTANT PROFESSORS

D. MENETREY, D.Sc., University of Paris VII France, 1981; Ph.D., University of Paris VI France, 1972

## ADJUNCT ASSISTANT PROFESSORS

J. D. DAW, Ph.D., Western Reserve University 1966

C. G. LINEBERRY, Ph.D., University of Delaware, 1970

R. J. MORFF, Ph.D., University of Missouri at Columbia, 1978

## VISITING INSTRUCTORS

J. D. GREENSPAN, Ph.D., Florida State University, 1980

H. MARTIN, Ph.D., University of Lyon, France 1983

## ADJUNCT INSTRUCTOR

M. J. SEDIVEC, Ph.D., University of North Carolina at Chapel Hill, 1977

## LECTURERS

J. CAPOWSKI, M.S., University of North Carolina at Chapel Hill, 1971

S. GETTES, M.D., University of Pennsylvania, 1958

## ADJUNCT LECTURER

D. M. SMITH, M.S.E.E., North Carolina State University, 1968

## POSTDOCTORAL FELLOWS

J. P. KILEY, Ph.D., Kansas State University, 1982

P. P. SCHEIBLE, Ph.D., Johns Hopkins University, 1976

S. P. SCHNEIDER, Ph.D., Emory University, 1982

## CURRICULUM

### *Courses for Health Professionals and Qualified Undergraduate Students*

90. BASIC PHYSIOLOGY (4). Prerequisites: Chemistry 11 and 21 or Biochemistry 7 and 8, Biology 45, or equivalents. A course in basic human physiology with an appreciation for its clinical relevance and application. Required of radiologic science majors and available to other students by permission of the instructor. *3 lecture and 2 laboratory-conference hours a week. Spring.* Glasser.

92. INTRODUCTION TO PHYSIOLOGY (5). Prerequisites: Chemistry 11 and 21 or Biochemistry 7 and 8, Biology 45 or equivalents. A course in basic human physiology and an appreciation for its clinical application. Emphasis is on body fluids, various organ systems and their interrelationships. Required of all nursing students and available to other students by permission of the instructor. *4 lecture and 2 recitation hours a week. Spring.* Yonce; staff.

93. INTRODUCTION TO PHYSIOLOGY (4). Prerequisites: Chemistry 11 and 21, Biology 45 or equivalents. A general course in mammalian physiology with emphasis on the various organ systems and their interrelationships. Required of all pharmacy students and available to other students by permission of the instructor. *3 lecture and 2 recitation hours a week. Fall.* Glasser; staff.

94. INTRODUCTION TO PHYSIOLOGY (5). Prerequisites: Chemistry 11 and 21, Biology 45 or equivalents. A course in basic human physiology with an appreciation for its clinical relevance and application. Required of physical therapy students and available to other students by permission of the instructor. *4 lecture and 2 laboratory-conference hours a week. Fall.* Staff.

103. PHYSIOLOGY FOR DENTAL STUDENTS (Dent 103fs) (3). Prerequisites: Chem 41, 61, 62 or equivalents. A general course in mammalian physiology with emphasis on basic concepts applicable to all organ systems and on concepts with particular relevance to dentistry. For graduate credit to selected students. *Fall and spring.* Dreyer; staff.

### *Courses for Graduate and Advanced Undergraduate Students*

102. INTRODUCTION TO MAMMALIAN PHYSIOLOGY (Physical Therapy 102) (5). Prerequisite: permission of the instructor. A general course in vertebrate physiology with emphasis on morphological and functional correlations, suitable for graduate students without extensive background in biology and chemistry. *Fall.* Staff.

111. BIOMEDICAL INSTRUMENTATION I (Biomedical Engineering-Biomedical Mathematics 111) (3). Prerequisites: Physics 101 or equivalent and permission of the instructor. The fundamentals of microprocessor theory and practical circuit design are presented in the context of biological applications. This course includes a laboratory and individual student projects. *Spring.* Hsiao.

140. CELL AND ORGAN SYSTEM PHYSIOLOGY (Neurobiology 140) (5). Prerequisite: permission of instructor. Principles of cell and organ system physiology suitable for students with a biology and chemistry background. *Fall.* McIlwain; staff.

190. TEACHING OF PHYSIOLOGY (1). Prerequisite: permission of the instructor. Instruction in techniques of lecturing. Includes delivery of formal, coached lectures on topics in physiology. *Fall and spring.* Stuart; staff.

### *Courses for Graduate Students*

202. ADVANCED PHYSIOLOGY I (3). Prerequisites: Physiology 140 or equivalent and permission of instructor. Selected topics in cellular, gastrointestinal and respiratory physiology covered in depth through lectures, seminars, and demonstrations. *Spring.* Staff.

203. ADVANCED PHYSIOLOGY II (3). Prequisites: Physiology 140 or equivalent and permission of instructor. Selected topics in cardiovascular, renal and endocrine physiology covered in depth through lectures, seminars and demonstrations. *Fall.* Arendshorst; staff.

204. ADVANCED NEUROPHYSIOLOGY (Neurobiology 200) (4). Prerequisites: Physiology 140, working knowledge of mammalian neuroanatomy and permission of the instructor. A course designed to provide detailed analysis of selected areas of neurophysiology such as synaptic transmission, sensory and motor systems, and higher integrative mechanisms. *3 lecture and 2 laboratory hours a week. Fall.* Marshall; staff.

211. SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 211) (3–5). Prerequisite: permission of the instructor. Individually arranged programs of study in depth in selected topics such as membrane function, transport physiology, renal physiology, etc. *Fall.* Staff.

212. SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 212) (3–5). Prerequisite: permission of the instructor. Individually arranged programs of study in depth of selected topics such as membrane function, transport physiology, renal physiology, etc. *Spring.* Staff.

217. THE COMPUTER IN THE LABORATORY (3). Prerequisites: ability to program in a high level language and permission of the instructor. Computing hardware, operating systems and languages. Data collection and analysis, A/D conversion techniques, intercontrol of experiments. Short programming exercises and semester project required. *2 lecture and 2 laboratory hours a week. Fall.* Capowski.

220. SEMINAR IN PHYSIOLOGY (1). Prerequisite: permission of the Departmental Director of Graduate Studies. Weekly seminars emphasizing current literature. *Fall.* Staff.

221. SEMINAR IN PHYSIOLOGY (1). Prerequisite: permission of the Departmental Director of Graduate Studies. Weekly seminars emphasizing current literature. *Spring.* Staff.

225. NEURAL INFORMATION PROCESSING (Biomedical Engineering-Biomedical Mathematics 221) (3). Prerequisites: Biomedical Engineering-Biomedical Mathematics 101 and Physiology 140 or equivalent. This approaches the nervous system as a data processing network, the brain as the computer for a homeostat. *Spring.* (Alternate years). Coulter.

227. CURRENT TOPICS IN PHYSIOLOGY (Zoology 227) (3). Prerequisite: one introductory course in physiology. Lecture and seminar consideration of selected advanced aspects of physiology. Topics will vary from year to year; may be repeated for credit. *Spring.* Staff.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290; Neurobiology 290; Pathology 290; Pharmacology 290; Psychology 290) (3). Prerequisite: permission of the Director of Training of the Neurobiology Curriculum. An intensive consideration of selected topics and problems. Participation required of Neurobiology Trainees. *Spring.* Faculty of the Neurobiology Curriculum.

301, 302, 303. RESEARCH IN PHYSIOLOGY (3–10 each). Hours to be arranged with the professor. *Fall, spring and summer.* Staff.

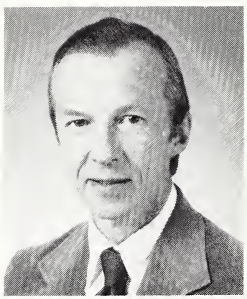
310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310; Neurobiology 310; Pathology 310; Pharmacology 310; Psychology 310; Biology 202) (3–12). Prerequisite: permission of a staff member. Research in various aspects of neurobiology. *6–24 hours a week. Fall and spring.* Faculty of the Neurobiology Curriculum.

393. MASTER'S THESIS (3 or more). *Fall and spring.* Staff.

394. DOCTORAL DISSERTATION (3 or more). *Fall and spring.* Staff.

400. GENERAL REGISTRATION (0).

# The Department of Psychiatry



The Department of Psychiatry is the clinical department of th School of Medicine which conducts the School's programs of edu cation, patient care and research in psychiatric medicine. The De partment offers psychiatric evaluation and treatment through its in patient, out-patient and consultation-liaison services in Nort Carolina Memorial Hospital and affiliated teaching hospitals, and provides comprehensive educational programs for medical stu dents, residents in psychiatry and other trainees affiliated with th University of North Carolina. Faculty members of the departmer conduct research programs in all major areas of modern psychiatry including investigations of the causes, prevention and treatment o mental illness. The department strives to create and sustain aca demic programs of national and international importance as well a to provide clinical services of the highest quality for those who see psychiatric care.

## PROFESSORS

A. J. PRANGE, Jr. (Acting Chair), M.D., University of Michigan, 1950

W. E. BAKEWELL, Jr., M.D., McGill University, 1949

G. R. BREESE, Jr. Ph.D., University of Tennessee, 1954

M. CLARKE (Emeritus), Ph.D., Duke University, 1954

T. E. CURTIS, M.D., Duke University, 1951

J. W. EDGERTON, Ph.D., Duke University, 1953

J. A. EWING, M.D., University of Edinburgh, Scotland, 1954

S. L. HALLECK, M.D., University of Chicago, 1952

W. G. HOLLISTER, (Emeritus) M.D., University of Nebraska, 1941

M. A. LIPTON, M.D., University of Chicago, 1948; Ph.D., University of Wisconsin, 1939

M. L. MILLER (Emeritus), M.D., Harvard University, 1929

R. D. MYERS, Ph.D., Purdue University, 195

P. A. OBRIST, Ph.D., University of Rochest 1958

D. A. RAFT, M.D., University of Nebraska, 19

E. SCHOPLER, Ph.D., University of Chica 1964

C. E. SMITH, M.D., George Washington Univ sity, 1941

R. F. SPENCER, M.D., Harvard University, 19

D. A. YOUNG (Emeritus), M.D., Harvard U versity, 1931

## ASSOCIATE PROFESSORS

J. J. ANDRESEN, M.D., University of Pennsyl nia, 1964

J. I. BOSWELL, Jr., M.D., University of Virgi 1957

G. B. BURNETT, M.D., University of Aberde Scotland, 1976

E. CARMEN, M.D., New York University, 19

R. HUNTER, M.D., University of Washington, 967 (resigned 12/8/83)

V. B. HUNTER, M.D., University of Washington, 968 (resigned 9/15/83)

. JAMES, Ph.D., Florida State University, 1965

. W. JENSEN, M.D., Case Western Reserve Uni- ersity, 1969

I. P. LINEBERGER, M.D., University of North Carolina at Chapel Hill, 1954

M. B. LIPTZIN, M.D., University of Rochester, 959

. T. LOOSEN, M.D., University of Munich, Ger- any, 1970 (resigned 8/31/83)

. M. MARCUS, Ph.D., University of Minnesota, 972

. B. MESIBOV, Ph.D., Brandeis University, 1974

. S. NEWMARK, Ph.D., University of Alabama, 970

I. PEREZ-REYES, M.D., National University of Mexico, 1952

R. SCHROEDER, Ph.D., University of Pitts- urgh, 1967

STABLER, Ph.D., University of North Carolina Chapel Hill, 1971

. A. TAYLOR, M.D., University of Tennessee, 57

K. WHITT, Ph.D., University of Texas, 1976

## SSISTANT PROFESSORS

W. BOAT, Ph.D., Case Western Reserve Uni- rsity, 1977

. L. EVANS, M.D., Temple University, 1976

. C. FIDLER, M.D., University of North Caro- a at Chapel Hill, 1975

C. GARBUTT, M.D., University of Illinois, 1975

T. GUALTIERI, M.D., Columbia University, 69

I. HAGGERTY, M.D., University of Maryland, 71

F. MCCARTNEY, M.D., Northwestern Univer- y, 1971

C. MCKEE, Ph.D., University of North Caro- a at Chapel Hill, 1976

F. SCHMITT, Jr., M.D., Louisiana State Uni- rsity, 1959

L. E. USSERY, Ph.D., Duke University, 1968

M. E. VAN BOURGONDIEN, Ph.D., University of Washington, 1979

N. J. WARREN, Ph.D., St. Louis University, 1979

## LECTURER

J. S. HUTCHESON, BSEE, North Carolina State University, 1964

## CLINICAL PROFESSORS

W. G. DAHLSTROM, Ph.D., University of Minnesota, 1949

M. D. GALINSKY, Ph.D., University of Michigan, 1961

P. J. IRIGARAY, M.D., Universidad Nacional Autonoma de Mexico, 1955

S. C. JAIN, Ph.D., Cornell University, 1964

J. W. OSBERG, M.D., Tufts University, 1948

M. SCHAEFER, D.P.A., Maxwell Graduate School, 1962

C. S. SCHROEDER, Ph.D., University of Pittsburgh, 1966

H. L. SMITH, Ph.D., University of Chicago, 1949

A. G. TOLLEY, M.D., University of Virginia, 1952

G. S. WELSH, Ph.D., University of Minnesota, 1949

N. P. ZARZAR, M.D., American University, Beirut, 1956

## CLINICAL ASSOCIATE PROFESSORS

J. R. COWAN, M.D., University of Oklahoma, 1958

J. R. T. DAVIDSON, M.B.B.S., University College, England, 1967

R. G. DEMERS, M.D., Georgetown University, 1964 (resigned 10/14/83)

R. H. FISSCHER, M.D., Leyden University, Holland, 1955

W. S. FLASH, Ph.D., Harvard University, 1954

D. F. FREEMAN, M.D., Wake Forest University, 1951

S. S. GUSTKE, M.D., West Virginia University, 1964

T. M. HAIZLIP, M.D., University of North Carolina at Chapel Hill, 1958

M. B. HRESKO, M.D., Jefferson Medical College, 1960

J. T. KONANC, Ph.D., University of North Carolina at Chapel Hill, 1972

P. P. LARA, M.D., University of Chile, 1963

C. P. LEWIS, M.S.W., School of Applied Social Science Western Reserve, 1941

B. S. LIPTON, M.D., University of Illinois, 1943

V. LONG, M.S.W., Case Western Reserve University, 1940

N. J. MARTIN, Ph.D., University of North Carolina at Chapel Hill, 1961

C. J. MCREE, M.D., Tulane University, 1946

J. D. MCREE, M.D., University of Tennessee, 1946

K. C. MILLS, Ph.D., Claremont Graduate School, 1970

J. T. MONROE, M.D., University of North Carolina at Chapel Hill, 1955

J. G. OLLEY, Ph.D., George Peabody College, 1972

R. L. ROLLINS, Jr., M.D., Duke University, 1956

S. SANDERS, Ph.D., University of Kentucky, 1967

J. J. SOLTYS, M.D., Harvard University, 1959

J. E. SOMERS, M.D., Duke University, 1953

S. K. TEEL, Ph.D., University of Tennessee, 1970

T. C. TOOMEY, Ph.D., University of Georgia, 1971

C. R. VERNON, M.D., Case Western Reserve University, 1952

R. W. WHITENER, M.D., Northwestern University, 1954

## CLINICAL ASSISTANT PROFESSORS

D. A. AMES, M.D.C.M., McGill University, 1968 (End of appointment 8/31/83)

R. F. BADAWI, D.P.M., Cairo University, London Conjoint, 1970

M. A. CALLAWAY, M.S.W., School of Applied Social Sciences Western Reserve, 1956

D. R. CARMICHAEL, M.B. Ch.B., Aberdeen University, Scotland, 1950

S. J. CEFALU, M.D., Louisiana State University 1960

T. R. CLARK, M.D., Harvard University, 1951

C. H. COLE, M.S.W., University of Wisconsin 1972

H. L. FRAZIER, M.D., University of Rocheste 1973

B. N. GORDON, Ph.D., University of Washing ton, 1978

R. R. GRIGG, Jr. M.D., University of North Car lina at Chapel Hill, 1971

G. W. HAMBY, M.D., University of North Car lina at Chapel Hill, 1958

F. H. HARRIS, M.S.W., University of Nort Carolina at Chapel Hill, 1968

C. W. LYNN, Jr., M.D., Medical College of Vi ginia, 1958

J. R. MAZZAGLIA, M.D., New York Medic College, 1971

P. H. MCDONAGH, M.B.B.Ch., National Un versity of Ireland, 1951

L. P. MOORE, M.D., University of Texas Medic Branch, 1966

R. J. MOORE, M.D., University of Toronto, C nada, 1952

V. H. MORCOS, D.P.M., Conjoint Board, E gland, 1969

W. G. NELSON, M.D., Colorado University, 19

B. S. OSTROW, M.D., University of Michiga 1966 (end of appointment 8/31/83)

C. A. PEDERSEN, M.D., Medical College Georgia, 1976

I. B. PISETSKY, M.D., Albert Einstein College Medicine, 1971

M. M. ROOD, M.D., University of North Car lina at Chapel Hill, 1955

B. W. ROYAL, M.D., Wake Forest Universi 1958

V. SHEA, Ph.D., University of North Carolina Chapel Hill, 1977

A. J. SHERROW, M.D., Ohio State Universi 1970

R. G. SWIFT, M.D., University of North Caroli at Chapel Hill, 1975

W. E. THOMAS, Ph.D., Michigan State Univ sity, 1955

L. S. TUCKER, M.D., Stanford University, 19

. A. VINSON, M.D., University of Virginia, 958

. H. WEINSTEIN, M.D., University of Missouri, 967

## LINICAL INSTRUCTORS

. M. BATSON, M.D., Louisiana State Univer-ity, 1977

. D. BRIDGES, M.D., University of North Caro-na at Chapel Hill, 1975

V. S. COMER, M.D., University of North Caro-na at Chapel Hill, 1977

. P. CORNWALL, M.D., Northwestern Univer-ty, 1970

). M. CONRAD, M.D., Medical University of outh Carolina, 1974

. L. CULBRETH, M.S.W., Tulane University, 971

1. J. DORFMAN, M.D., Tufts University, 1977

. A. EDELSOHN, M.D., Temple University, 978

. L. HALLECK, M.S.W., University of North arolina at Chapel Hill, 1975

. KIRKPATRICK, M.D., University of Texas, 978

1. S. LANCASTER, M.D., Tulane University, 975

R. LEVITT, M.D., Case Western Reserve Uni-rsity, 1976

L. POPE, M.D., University of Louisville, 1972

. M. REID, M.D., University of North Carolina Chapel Hill, 1975

. A. SALDIAS, M.D., San Marcos University, ru, 1951

. B. SIBRACK, M.D., Michigan State Univer-y, 1975

. T. VERWOERDT, M.S.W., University of North arolina at Chapel Hill, 1972

H. WEISLER, M.D., University of North Caro-a at Chapel Hill, 1976

## CLINICAL LECTURERS

B. C. BALL, Ph.D., University of North Carolina at Chapel Hill, 1968

B. F. CORDER, Ed.D., University of Kentucky, 1966

D. E. FRICK, M.D., University of North Carolina at Chapel Hill, 1974

F. HALL, M.D., Harvard University, 1957

N. V. MENGEL, Ph.D., University of California, 1973

J. J. MOYLAN, Ph.D., University of Massachusetts at Amherst, 1957

## ADJUNCT PROFESSOR

P. A. WALKER, M.D., Medical College of South Carolina, 1959

## ADJUNCT ASSISTANT PROFESSORS

B. B. HARRIS, Ph.D., University of Wisconsin, 1955

R. H. SHIGLEY, Ph.D., University of Georgia, 1973

J. L. SLOAN, Ph.D., Emory University, 1971

A. J. WALL, Ph.D., University of North Carolina at Chapel Hill, 1971

## RESEARCH ASSISTANT PROFESSORS

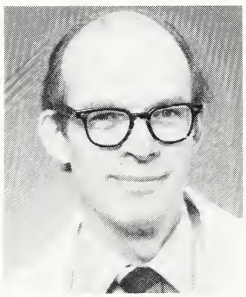
M. M. BRISTOL, Ph.D., University of North Carolina at Chapel Hill, 1979

K. C. LIGHT, Ph.D., Syracuse University, 1976

## RESEARCH ASSOCIATE PROFESSOR

R. B. MAILMAN, Ph.D., North Carolina State University, 1974

# The Department of Radiology



The department is primarily engaged in the radiologic and radiotherapeutic care of patients. Conventional x-ray techniques are blended with the newer imaging modalities of computerized tomography, ultrasound, and nuclear medicine for the best possible assessment of pathologic processes. Basic and clinical research is being carried forward, particularly in imaging, including studies in nuclear magnetic resonance, to maximize diagnostic information. The department is developing a Picture Archiving Communication System for the transmission and interpretation of digitized images and especially those prepared in a 3-D format. The radiotherapy division has a strong research interest in hyperthermia used as an adjuvant for radiation treatment. The teaching programs of the department have been designed to promote understanding and the appropriate use of the diagnostic and therapeutic techniques employed.

## PROFESSORS

J. H. SCATLIFF (Chair), M.D., Northwestern University, 1952

C. A. BREAM, M.D., Temple University, 1940

R. L. CLARK, M.D., Johns Hopkins University, 1966

D. J. DELANY, MB, B.Chir, Cambridge University, England, 1963

E. V. STAAB (Associate Chair), M.D., University of Minnesota, 1961

## ASSOCIATE PROFESSORS

J. T. CUTTINO, M.D., University of North Carolina at Chapel Hill, 1971

F. A. DIBIANCA, Ph.D., Carnegie-Mellon University, 1970

W. B. GUILFORD, M.D., University of North Carolina at Chapel Hill, 1973

P. F. JAQUES, M.B.B.S., (Med.) Middlesex Hospital Medical School, England, 1970

R. E. JOHNSTON, Ph.D., Vanderbilt University 1965

K. KILLEBREW, M.D., Columbia University, 196

W. H. MCCARTNEY, M.D., Northwestern Un versity, 1969

C. A. MITTELSTAEDT, M.D., University of A kansas, 1971

R. A. WHALEY, M.D., Medical College of Wi consin, 1957

## ASSISTANT PROFESSORS

G. GAISIE, M.B., Ch.B. (Med.), University Ghana, 1972

R. J. KOWALSKY, Pharm.D., University of Ke tucky, 1972

L. KWOCK, Ph.D., University of California, 19

V. MANDELL, M.D., University of North Car lina at Chapel Hill, 1971

M. A. MAURO, M.D., Cornell University, 19

J. R. PERRY, M.D., University of Tennessee, 19

L. M. VINCENT, M.D., University of Kans 1977

## NSTRUCTORS

. C. BRENTON, M.D., University of Iowa, 1979

. B. BURNS, Cert, R.T., B.S., 1978; M.S.P.H., niversity of North Carolina at Chapel Hill, 1982

. W. TURNER, M.A., North Carolina Central niversity, 1979

## DJUNCT PROFESSOR

M. PIZER, Ph.D., Harvard University, 1967

## DJUNCT ASSOCIATE PROFESSOR

R. MATTESON, D.D.S., University of Penn-lvania, 1962; Certificate in Radiology, Univer-ty of Connecticut, 1971

## DJUNCT ASSISTANT PROFESSOR

L. THORPE, M.S., State University of New ork, 1973

## ESEARCH ASSOCIATE PROFESSOR

M. W. TSUI, Ph.D., University of Chicago, 77

## ESEARCH ASSISTANT PROFESSOR

C. YANKASKAS, Ph.D., University of North arolina at Chapel Hill, 1982

## LINICAL PROFESSOR

MCLELLAND, M.D., University of Cincinnati, 48

## LINICAL ASSISTANT PROFESSORS

D. BARRY, M.D., University of North Carolina Chapel Hill, 1976

A. CERWIN, M.D., Cornell University, 1970

E. CLARK, M.D., University of North Caro-a at Chapel Hill, 1961

E. CLONINGER, M.D., University of North rolina at Chapel Hill, 1966

G. DETWEILER, M.D., Emory University, 78

W. E. DEYTON, M.D., University of North Carolina at Chapel Hill, 1965

W. E. DROBNES, M.D., Faculte de Medecine De Tours, France, 1976

G. J. FISCHER, M.D., University of Missouri, 1972

J.S. HALLE, M.D., Tufts University, 1975

P. HATTEN, M.D., West Virginia University, 1973

H. J. HIDALGO, M.D., George Washington University, 1976

F. L. HONEYCUTT, M.D., University of North Carolina at Chapel Hill, 1967

R. S. KRUSE, M.D., Georgetown University, 1971

J. R. LINA, M.D., College of Medicine of New Jersey, 1973

H. R. MADRY, M.D., Wake Forest University, 1956

J. M. MATHIS, M.D., Vanderbilt University, 1976

R. J. MAX, M.D., Rutgers University, 1977

W. H. MOSER, M.D., University of North Carolina at Chapel Hill, 1974

W. R. NICOLAY, M.D., Washington University, 1954

G. H. PIERSON, M.D., Duke University, 1954

T. L. POPE, M.D., University of North Carolina at Chapel Hill, 1978

R. E. SCHAAF, M.D., Tufts University, 1976

G. W. SCHLASEMAN, M.D., Duke University, 1946

D. R. SHAW, M.D., University of North Carolina at Chapel Hill, 1973

R. I. SUBERMAN, M.D., University of North Carolina at Chapel Hill, 1970

D. B. WASHBURN, Ph.D., North Carolina State University, 1975

D. E. WERTMAN, M.D., Ohio State University, 1976

C. B. WILCOX, M.D., University of Michigan, 1973

K. H. WINTER, M.D., University of North Carolina at Chapel Hill, 1975

M. E. ZELENIK, M.D., Vanderbilt University, 1978

## CLINICAL ASSOCIATE PROFESSORS

O. W. DOYLE, M.D., Yale University, 1947

O. N. FISHER, M.D., University of North Carolina at Chapel Hill, 1959

J. A. GREEN, M.D., University of North Carolina at Chapel Hill, 1957

A. M. JENKINS, M.D., University of Cincinnati, 1947

M. A. JONES, M.D., University of North Carolina at Chapel Hill, 1959

R. S. LACKEY, M.D., Jefferson University, 1948

D. M. MONSON, M.D., University of Wisconsin, 1955

R. A. OLDER, M.D., Duke University, 1968

G. M. PADDISON, M.D., University of North Carolina at Chapel Hill, 1966

C. L. PARTAIN, M.D., Washington University, 1975; Ph.D., Purdue University, 1967

R. S. SALMON, M.D., Washington University 1961

E. B. SPANGLER, M.D., University of Pennsylvania, 1952

W. H. SPRUNT III, M.D., Harvard University 1945

## RADIATION ONCOLOGY

## ASSOCIATE PROFESSORS

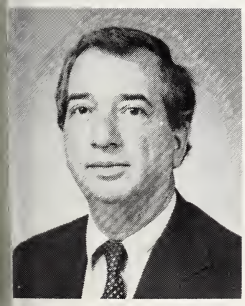
E. L. CHANEY, Ph.D., University of Tennessee 1969

M. A. VARIA, M.B., Ch.B., University of Liverpool, England, 1967

## ASSISTANT PROFESSORS

J. G. ROSENMAN, Ph.D., University of Texas a Austin, 1971; M.D., University of Texas SW, 197

# *The Department of Social and Administrative Medicine*



Illness and healing take place in a socio-cultural context that embraces the complexity of the human world, including social values, historical legacy and changing social, economic and political forces. The Department of Social and Administrative Medicine is concerned with this larger social dimension of medicine and pursues its work with three purposes in mind: 1) to articulate that body of social science, humanities and public health knowledge most appropriate to medical education; 2) by incorporating that knowledge with its methods and perspectives into the preclinical, clinical and post-graduate training; and 3) to develop research and service activities consistent with a scholarly interest in that body of knowledge. The Department carries out its work through programs of teaching, research and public service and relies on a multidisciplinary faculty and an interdisciplinary approach. Represented on the Department's faculty are specialists in clinical medicine, public health, public policy, medical administration, philosophy and ethics, history, literature, anthropology, sociology, epidemiology, political science, economics and law.

## PROFESSORS

G. WILSON (Chair), M.A., University of Oklahoma, 1952

A. BRYAN II, M.D., University of Pennsylvania, 1957

G. H. DEFRIESE, Ph.D., University of Kentucky, 1967

C. FORDHAM III, M.D., Harvard University, 1951

M. A. IBRAHIM, M.D., Cairo University, Egypt

D. L. MADISON, M.D., Loma Linda University, 1965

T. T. PHILLIPS (Emeritus), M.D., University of Cape Town, South Africa, 1956

G. G. SHEPS (Taylor Grandy Distinguished Professor), M.D., University of Manitoba, Canada, 1936

## ASSOCIATE PROFESSORS

D. E. BEAUCHAMP, Ph.D., Johns Hopkins University, 1973

L. R. CHURCHILL, Ph.D., Duke University, 1973

A. J. HOOLE, M.D., Medical College of South Carolina, 1964

W. F. JESSEE, M.D., University of California at San Diego, 1972

D. L. PATRICK, Ph.D., Columbia University, 1972

C. G. PICKARD, M.D., University of North Carolina at Chapel Hill, 1962

## ASSISTANT PROFESSORS

L. S. CAMPBELL, M.H.A., Medical College of Virginia, 1962

A. W. CROSS, M.D., Columbia University, 1970

S. E. ESTROFF, Ph.D., University of Wisconsin at Madison, 1978

D. K. RUNYAN, M.D., University of Minnesota, 1976

## ADJUNCT PROFESSORS

D. R. BARRY, M.B.A., University of Chicago, 1964

A. GELLHORN, M.D., Washington University, 1937

F. H. GRIFFITH, M.A., Algoma College, Canada, 1972

P. NELSON, Ph.D., University of Oklahoma, 1956

R. PREYER, LL.B., Harvard Law School, 1949

M. H. ROSS, LL.B., University of North Carolina at Chapel Hill, 1952

H. H. TILSON, M.D., Washington University, 1964

A. YEDIDIA, B.A., Hebrew University, 1930

## ADJUNCT ASSOCIATE PROFESSORS

J. D. BERNSTEIN, M.H.A., University of Michigan, 1968

L. M. CUTCHIN, M.D., University of North Carolina at Chapel Hill, 1962

W. D. FULLERTON, B.A., University of Rochester, 1951

J. A. PAYNE IV, M.P.H., University of North Carolina at Chapel Hill, 1968

F. D. PICKARD, M.S.N., University of North Carolina at Chapel Hill, 1968

P. SOLBERG, J.D., University of North Carolina at Chapel Hill, 1976

T. H. TULCHINSKY, M.D., University of Toronto, Canada, 1961

## ADJUNCT ASSISTANT PROFESSORS

N. J. MCDONALD, D.P.A., George Washington University, 1971

D. D. METZ, M.P.A., New York University, 1973

P. J. MORRIS, M.D., University of North Carolina at Chapel Hill, 1978

E. B. MUNSON, M.B.A., University of Chicago, 1967

R. L. RHYNE, Jr., M.D., University of New Mexico, 1977

D. G. THOMPSON, M.B.B.S., London Hospital Medical College, England, 1972

H. F. THOMPSON, M.B.B.A., University of London, England, 1972

## ADJUNCT INSTRUCTORS

N. M. KING, J.D., University of North Carolina at Chapel Hill, 1980

H. LITTLEJOHN

## RESEARCH ASSISTANT PROFESSOR

G. E. HENDERSON, Ph.D., University of Michigan, 1982

## RESEARCH ASSOCIATE PROFESSOR

R. P. STRAUSS, D.M.D., University of Pennsylvania, 1972

## RESEARCH PROFESSOR

J. C. COWAN, Ph.D., University of Oklahoma 1964

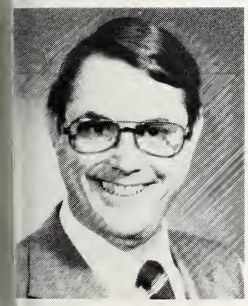
## LECTURER

JOSE SIMAN, M.A., University of North Carolina at Chapel HIll, 1981

## VISITING PROFESSOR

M. LIPKIN, M.D., Cornell University, 1930

# *The Department of Surgery*



The Department of Surgery is composed of eight divisions, namely, Cardiothoracic, General Surgery, Neurosurgery, Orthopaedic Surgery, Otolaryngology, Plastic and Reconstructive Surgery, Urology and Vascular Surgery. The goals of the department are to provide exemplary clinical care in all surgical disciplines, to provide opportunities for education in surgery at the undergraduate and graduate level, to generate new knowledge by the conduction of basic science and clinical investigation, and to provide community service. Each surgical discipline attempts to achieve these goals with an underscoring of excellence. The specific programs will vary with the interest of the faculty, facilities, and current needs. Graduate educational programs are conducted in all surgical disciplines.

## 'ROFESSORS

;EORGE F. SHELDON (Chair), M.D., University f Kansas, 1961.

. G. BEVIN, M.D., Yale University, 1960.

V. P. BIGGERS, M.D., University of North Caro- na, 1963.

. ROBERT BRASHEAR, M.D., University of alifornia at San Francisco, 1945.

)SEPH A. BUCKWALTER, M.D., University of ennsylvania, 1944.

AUL L. BUNCE (Emeritus), M.D., University of hicago, 1942.

ORMAN A. COULTER, M.D., Harvard Uni- ersity, 1950.

EWTON D. FISCHER, M.D., University of Tex- at Galveston, 1945.

.OYD A. FRIED, M.D., University of Chicago, 61.

EORGE JOHNSON, Jr., M.D., Cornell Univer- y, 1950.

. STEPHEN MAHALEY, Jr., M.D., Ph.D., uke University, 1959.

'ANLEY R. MANDEL, M.D., University of Vir- ia, 1962.

GORDON F. MURRAY, M.D., University of Michigan, 1963.

JAMES F. NEWSOME, M.D., Vanderbilt University, 1949.

HUGH D. PETERSON, D.D.S., Northwestern University, 1956; M.D., Northwestern University, 1962.

HERBERT J. PROCTOR, M.D., New York University, 1962.

ERNEST W. SMALL (Oral Surgery) D.D.S., University of Minnesota, 1945.

PETER J. K. STAREK, M.D., Ohio State University, 1964.

ROY V. TALMAGE, Ph.D., Harvard University, 1947

C. G. THOMAS, Jr., M.D., University of Chicago, 1943

WILLIAM C. TRIER, M.D., New York Medical College, 1947.

DONALD W. WARREN, (Dental Ecology) D.D.S., University of North Carolina, 1959; Ph.D., University of Pennsylvania, 1963.

BENSON R. WILCOX, M.D., University of North Carolina, 1957.

FRANK C. WILSON, M.D., Medical College of Georgia, 1954.

## ASSOCIATE PROFESSORS

STEVEN J. BURNHAM, M.D., Vanderbilt University, 1972.

ROBERT D. CROOM III, M.D., University of North Carolina, 1964.

RODGER M. DALSTON, Ph.D., Northwestern University, 1972.

WALTER B. GREENE, M.D., University of North Carolina, 1972.

CHARLES A. HERBST, Jr. M.D., University of Mississippi, 1967.

HENRY S. HSIAO, Ph.D., University of California at Berkeley, 1972.

CAROL N. LUCAS, Ph.D., University of North Carolina, 1973.

LOCKERT B. MASON, M.D., Medical College of Virginia, 1954.

DON D. MICKEY, Ph.D., Louisiana State University, 1969.

HAROLD C. PILLSBURY III, M.D., George Washington University, 1972.

MICHAEL J. ROSNER, M.D., Medical College of Virginia, 1972.

TIMOTHY N. TAFT, M.D., University of Missouri, 1969.

W. GRADY THOMAS, Ph.D., University of Florida, 1968.

## ASSISTANT PROFESSORS

ALBERT J. BANES, Ph.D., Virginia Commonwealth University, 1974.

JAMES W. BATTAGLINI, M.D., University of Rochester, 1973.

DONALD K. BYNUM, M.D., University of Texas at Houston, 1976.

LAURENCE E. DAHNERS, M.D., University of Arizona, 1978.

TERRY L. FRY, M.D., University of North Carolina, 1973.

JEROME A. GILBERT, Ph.D., Duke University, 1982.

ALFRED R. HANSEN, Ph.D., University of Iowa, 1970; M.D., University of Iowa, 1977.

F. DOUGLAS JONES, M.D., Eastern Virginia Medical School, 1977.

BLAIR A. KEAGY, M.D., University of Pittsburgh, 1970.

PAUL F. LACHIEWICZ, M.D., Cornell University, 1977.

JAMES MANDELL, M.D., University of Florida, 1970.

DUNCAN S. POSTMA, M.D., University of North Carolina, 1977.

STEPHEN K. POWERS, M.D., Ohio State University, 1977.

STEVEN J. STAFFORD, M.D., University of Chicago, 1976.

ROBERT M. WEISSMAN, M.D., University of Illinois, 1973.

## RESEARCH ASSOCIATE PROFESSORS

G. YANCEY GILLESPIE III, Ph.D., University of Mississippi, 1971.

MIRIAM M. HENSON, Ph.D., Yale University 1967.

JIRI PRAZMA, M.D., Charles University, Prague 1960.

## RESEARCH ASSISTANT PROFESSORS

WILLIAM C. BECKMAN, Ph.D., University of Michigan, 1979.

## LECTURER

JAMES S. HUTCHESON (Psychiatry), BSEE North Carolina State University, 1964.

## CLINICAL PROFESSORS

STEPHEN C. BOONE, M.D., Duke University 1965.

THOMAS B. DAMERON, M.D., Duke University, 1947

JAMES E. DAVIS, M.D., University of Pennsylvania, 1943.

MICHAEL E. GLASSCOCK III, M.D., University of Tennessee, 1958.

HAROLD F. HAMIT, M.D., New York University, 1945.

RALPH R. LANDES, M.D., University of Chicago, 1939.

FRANCIS ROBICSEK, M.D., University of Budapest, 1950.

HERMAN M. SCHIEBEL, M.D., Johns Hopkins University, 1933.

JOHN J. SHEA, Jr., M.D., Harvard University, 1947.

ROBERT L. TIMMONS, M.D., Harvard University, 1953.

OE M. VAN HOY, M.D., Duke University, 1938.

## CLINICAL ASSOCIATE PROFESSORS

OHN B. CODINGTON, M.D., University of Maryland, 1953.

OSEPH L. DEWALT, M.D., University of North Carolina, 1958.

AMES R. DINEEN, M.D., University of Rochester, 1945.

VAYNE S. FERGUSON, M.D., Columbia University, 1966.

OWELL G. FOX, M.D., Medical College of Virginia, 1952.

AMES P. HAMILTON, M.D., University of Pennsylvania, 1958.

RA M. HARDY III, M.D., University of North Carolina, 1963.

IENRY G. HARTZOG III, M.D., University of North Carolina, 1962.

)LIVER R. HUNT, Jr., M.D., University of Louisville, 1951.

VALTER J. LOEHR, M.D., Cornell University, 963.

ONALD T. LUCEY, M.D., Duke University, 963.

OEL B. MCDEVITT, M.D., University of North arolina, 1964.

VING MELNICK, M.D., Jefferson Medical Colge, 1960.

ORACE G. MOORE, M.D., Johns Hopkins Unirsity, 1945.

)WIN T. PRESTON, M.D., Duke University, 960.

ILLIAM G. SULLIVAN, M.D., Loyola Univery, 1960.

LIS A. TINSLEY, M.D., Vanderbilt University, 59.

EDWIN J. WELLS, M.D., University of Pennsylvania, 1946.

CHARLES A. WILKINSON, M.D., Duke University, 1956.

R. BERTRAM WILLIAMS, M.D., Vanderbilt University, 1943.

ROBERT B. WINSLOW, Columbia University, 1962.

## CLINICAL ASSISTANT PROFESSORS

CHARLES H. ASHFORD, Jr., M.D., Johns Hopkins University, 1962.

W. WOODROW BURNS, M.D., University of North Carolina, 1969.

JAMES P. BROWDER III, M.D., University of North Carolina, 1970.

PAUL L. BURROUGHS, M.D., University of North Carolina, 1966.

JOHN P. CLARKE, M.D., Medical College of Virginia, 1960.

STANLEY C. COX III, M.D., University of Colorado, 1968.

DWIGHT G. DAVIS, Jr., M.D., Jefferson Medical College, 1954.

CHARLES M. EARLEY, Jr., M.D., Duke University, 1953.

GEORGE S. EDWARDS, M.D., University of North Carolina, 1957.

JOHN R. EMMETT, M.D., George Washington University, 1970.

LAWRENCE G. FEHRENBAKER, M.D., Wayne State University, 1963.

EDGAR C. GARRABRANT, M.D., University of North Carolina, 1966.

ELZIE F. HART, M.D., University of North Carolina, 1967.

GEORGE P. HENDERSON, M.D., University of North Carolina, 1964.

JOHN T. HENLEY, Jr., M.D., University of North Carolina, 1972.

ALLAN A. HOFFMAN, M.D., Harvard University, 1960.

RICHARD D. KANE, M.D., Northwestern University, 1971.

BRUCE L. KIHLSTROM, M.D., University of North Carolina, 1972.

JOHN R. KROHN, M.D., University of Minnesota, 1966.

CYNTHIA A. KUPPER, BSN, University of North Carolina, 1968.

JOHN R. LEONARD III, M.D., University of North Carolina, 1970.

WALTER S. LOCKHART, Jr., M.D., Wake Forest University, 1944.

WILLIAM J. MCDANIEL, M.D., University of North Carolina, 1967.

JOHN R. MORRIS, M.D., Medical University of South Carolina, 1961.

RICHARD S. MYERS, M.D., Washington University, 1965.

JOHN W. PACKER, M.D., Wake Forest University, 1965.

JEROME P. PARNELL II, M.D., State University of New York, 1974.

GEORGE W. PASCHAL III, M.D., Wake Forest University, 1973.

HOKE D. POLLOCK, M.D., University of North Carolina, 1975.

ROBERT E. PRICE, Jr., M.D., University of North Carolina, 1964.

MILTON D. QUIGLESS, Jr., M.D., Meharry Medical College, 1971.

DONALD B. REIBEL, M.D., Indiana University, 1957.

JOHN F. RHODES, M.D., University of North Carolina, 1962.

FRANK L. TORTORA, Jr., M.D., Emory University 1977.

HENRY A. UNGER, M.D., Vanderbilt University, 1972.

GEORGE C. VENTERS, M.D., University of North Carolina, 1971.

LEOPOLD M. WALDENBERG, M.D., Tufts University, 1965.

PAUL H. WRIGHT, M.D., Wake Forest University, 1974.

JAMES R. WRIGHT, M.D., University of Maryland, 1940.

DOUGLAS B. YOUNG, M.D., University o North Carolina, 1974.

## CLINICAL INSTRUCTORS

MICHAEL J. ANDREWS, Jr., M.D., Duke Uni versity, 1972.

BENJAMIN DOUGLAS, M.D., University o North Carolina, 1975.

DAVID M. FAJGENBAUM, M.D., Tulane Uni versity, 1975.

FRED J. LONG, Jr., M.D., Meharry Medical Col lege, 1972.

DENNIS B. NICKS, M.D., University of Missou ri, 1977.

RICHARD M. SATAVA, M.D., Hahnemann Medical College, 1968.

MICHAEL THOMASON, M.D., University o North Carolina, 1978.

JAMES S. WILSON, Jr., M.D., University o North Carolina, 1975.

## ADJUNCT PROFESSORS

CHARLES F. STARMER, Jr., Ph.D., University o North Carolina, 1968.

## ADJUNCT ASSOCIATE PROFESSORS

STANLEY J. MARTINKOSKY, Ph.D., Ohio Stat University, 1975.

# *Curriculum in Biomedical Engineering and Mathematics*

Biomedical Engineering and Mathematics is a new field stressing the application of engineering techniques, mathematical analysis, and biomedical computing to medical problems. This curriculum offers graduate education in this field leading to the Master of Science and Doctor of Philosophy degrees. Arrangements may be made for qualified medical students to work for a joint M.D.-Ph.D. degree under this program.

Students enter this program with a wide variety of backgrounds, in engineering, physical science, mathematics, or biological science. Curricula are tailored to fit the needs and develop the potentials of individual students. All students select courses from the core curriculum (described below). In addition, courses in biostatistics, computer science, physiology, and mathematics or engineering provide a well rounded background of knowledge and skills.

The program is distinctive in that it is one of the few in this field that is physically and administratively situated in a medical school. This has the advantage of placing students in close contact with a medical staff, clinical problems, and ongoing medical research, providing many unique opportunities to apply their talents in a project-oriented atmosphere. The Alexander F. Fortune Biomedical Computation Center and other computing facilities are also available. Graduates of this program are well qualified to apply engineering, mathematics, and biomedical computing in hospitals, clinics, private research laboratories, government laboratories, and other institutions involved in health care delivery.

## PROFESSORS

R. N. JOHNSON (Chair) (Neurology)

N. A. COULTER, Jr., (Director, Graduate Studies) (Surgery)

S. M. PIZER (Computer Science)

## RESEARCH PROFESSOR

D. S. BIELMAN (President, Microelectronics Center of North Carolina)

## ASSOCIATE PROFESSORS

F. A. DIBIANCA (Director, Microelectronics Program) (Radiology)

H. S. HSIAO (Surgery)

L. R. YONCE (Physiology)

## RESEARCH ASSOCIATE PROFESSORS

J. J. BRICKLEY (Neurology)

B. M. W. TSUI (Radiology)

## ASSISTANT PROFESSORS

J. W. BUCHANAN (Medicine)

D. CHOU (Clinical Laboratory Automation)

C. L. LUCAS (Surgery)

S. R. QUINT (Neurology)

## RESEARCH ASSISTANT PROFESSORS

J. D. CHARLTON (Neurology)
R. H. PROPST (Neurology)

## ADJUNCT ASSOCIATE PROFESSORS

M. L. MCCARTNEY (Neurology)
D. J. ROUSE (Research Triangle Institute)

## CURRICULUM

*Courses for Graduates and Advanced Undergraduates*

102. BIOMECHANICS (4). Prerequisites, Physics 26, Math 128 or equivalent, and permission of the instructor. Fundamental principles of mechanics, biologically exemplified, are presented, including solid and fluid mechanics applied to cardiovascular, respiratory, cerebrospinal fluid and musculoskeletal systems. Minicomputer simulations are used to demonstrate system properties. *Fall.* Gilbert.

103. BIOELECTRIC PHENOMENA (3). Prerequisites, Physics 27, Math 128 or equivalent. Fundamental principles of electromagnetism are applied to analysis of bioelectric phenomena, such as passive electrical properties of tissues, membrane potentials, Maxwell's equations for tissue volume conductors, etc. *Spring.* Coulter.

106. NETWORK TRANSFORM METHODS (3). Prerequisite, Physics 101. Analysis of linear systems by transform methods. Applications of Laplace and Fourier transform Fourier series to networks. Pole zero plots and stability analysis. *Spring.* Propst.

107. ACTIVE NETWORK ANALYSIS (4). Prerequisite, Physics 101. Physics and network models of active devices; diodes, transistors and integrated circuits. Applications of devices in systems. Frequency response of devices as well as filter design. *Fall.* Propst.

111. BIOMEDICAL INSTRUMENTATION I (3). Prerequisites, Physics 101 or equivalent, and permission of the instructor. The fundamentals of microprocessor theory and practical circuit design are presented in the context of biological applications. This course includes a laboratory and individual student projects. *Spring.* Hsiao.

112. BIOMATERIALS (3). Prerequisites, Physiology 140 or equivalent. The interaction between non-living implants and living tissue is studied, with emphasis on the properties of implant materials. *Fall.* Hanker.

120. REAL-TIME COMPUTER APPLICATIONS I (3). Prerequisite, Computer Science 16 or equivalent. Introduction to digital and analog computers for on-line, real-time processing of biomedical signals. Assembly language programming is stressed with applications ranging from control of peripheral devices to interactions with higher level languages. *Fall.* Charlton, Brickley.

121. DIGITAL SIGNAL PROCESSING I (3). Prerequisite, Computer Science 16 or equivalent. This is an introduction to methods of automatic computation of specific relevance to biomedical problems. Sampling theory, analog-to-digital conversion, digital filtering will be explored in depth. *Spring.* Lucas.

122. BIOMEDICAL DATABASE SYSTEMS (3). Prerequisite, Computer Science 16 or equivalent. Relational, hierarchical, and network data models are applied to medical systems. Management of system integrity, security, and reliability is discussed. *Fall.* Staff.

128. ANALYSIS OF DIGITAL SYSTEMS (3). Prerequisites, Physics 101, 102. Application of Boolean algebra to the analysis and synthesis of switching circuits; techniques of minimizing Boolean functions; number systems; arithmetic operations; threshold logic, asynchronous; synchronous machines. *Fall.* Johnson.

131. INTRODUCTION TO BIOMATHEMATICS (3). Prerequisite: Mathematics 32 or equivalent. An introduction to the dynamic analysis of biological systems, including: differential equations of behavior, transient response, Fourier analysis and frequency response, and applications of the LaPlace transform in biology and medicine. *Fall.* Lucas.

132. LINEAR CONTROL THEORY (3). Prerequisite, Math 128 or equivalent. Linear control systems analysis and design are presented, with emphasis on biological applications. Frequency and time domain characteristics and stability criteria are studied. *Fall.* Quint.

141. MEDICAL IMAGING I (3). Prerequisites, Math 34, Physics 27. Basic physics of x-radiation, gamma radiation, nuclear magnetic resonance and ultrasound are applied to medical imaging problems. Digital electronics radiation interaction and detection, image analysis and counting statistics are treated. *Fall.* DiBianca.

142. MEDICAL IMAGING II. Prerequisite, BMME 141. Modern medical diagnostic image techniques and instrumentation are studied, including classical and digital radiography, computed tomography, nuclear medicine, nuclear magnetic resonance, and ultrasound, with emphasis on clinical utility. *Spring.* Tsui.

### *Courses For Graduate Students*

201. BIOMEDICAL INSTRUMENTATION II (3). Prerequisite, BMME 111 or permission of the instructor. Topics include analysis of medical instrumentation with emphasis on pressure, flow, bioelectric, and ultrasonic transducers. This course includes a laboratory and interfaces microprocessors with transducers. Students are given the opportunity to design and fabricate original devices. *Fall.* Hsiao.

202. APPLICATIONS OF MICROELECTRONICS TO MEDICINE (3). Prerequisites, BMME 111, BMME 201, Physiology 140 or equivalent, and permission of the instructor. Principles of integrated circuit design for implantable biomedical devices are studied. *Spring.* Hsiao.

203. BIOMEDICAL APPLICATIONS OF MICROPROCESSORS (3). Prerequisites, BMME 111 or equivalent, and permission of instructor. Fundamental principles of microprocessor-based medical instrumentation are presented. Students are given practical experience in medical instrument design in laboratory. *Fall.* Hsiao.

220. REAL-TIME COMPUTER APPLICATIONS II (3). Prerequisite, BMME 120. Problems of interfacing minicomputers with biomedical devices and systems are studied, with projects including process control, data acquisition, disk system interfaces and serial, parallel and DMA interfaces between interconnected minicomputers. *Spring.* Charlton.

221. NEURAL INFORMATION PROCESSING (3). Prerequisites, BMME 101 and Physiology 140 or equivalent. This approaches the nervous system as a data processing network, the brain as the computer for a homeostat. *Spring.* (Alternate years). Coulter.

222. HEMODYNAMICS (3). Prerequisites, BMME 102, Physiology 140 or equivalent. The dynamics of blood flow in blood vessels is studied from the standpoint of modern continuum mechanics. Mathematical models of cardiac action and cardiovascular regulation are included. *Fall.* Coulter.

223. DIGITAL SIGNAL PROCESSING II (3). Prerequisites, BMME 121, BMME 131, BMME 132 or equivalent. Advanced techniques for analysis of biomedical systems and signals are presented, including signal characterization, pattern recognition, and parameter estimation. Examples from biomedical literature are studied. *Spring.* Quint.

228. DIGITAL SYSTEM DESIGN AND APPLICATIONS. Prerequisite, BMME 128. Computer organization at the register level; design of hardware and microprogrammed control logic. Emphasis is on implementation of computer organization in hardware, utilizing current technology. Laboratory required. *Spring.* Johnson.

231. SPECIAL TOPICS (Hours to be arranged). Prerequisite, permission of the instructor. Special library and/or laboratory work on an individual basis on specific problems in biomedical engineering and biomedical mathematics. Direction of students will be on a tutorial basis, and subject matter will be selected on the basis of individual needs. *Every semester.* Staff.

232. DIGITAL CONTROL THEORY (3). Prerequisite, BMME 132 or equivalent. Advanced methods of linear and non-linear control are addressed, with applications to both engineering and biological systems, including solutions using the digital computer. *Spring.* Quint.

233. BIOMATHEMATICAL MODELLING (3). Prerequisite, Math 128 or equivalent. Mathematical modelling and computer simulation of physiological and other biomedical systems, with emphasis on application of ordinary and partial differential equations. Analytical and digital solution techniques are considered. *Fall.* Lucas.

241. INTRODUCTION TO BIOMEDICAL ENGINEERING (2). Prerequisite, none. Regular seminars on topics of current interest given by staff members, visiting professors, and advanced students. Attendance required of all students in the biomedical engineering and mathematics program. *Fall.* Staff.

251. DIGITAL X-RAY IMAGING (3). Prerequisites, BMME 141, BMME 142. Advanced topics of physics and instrumentation in digital x-ray imaging techniques are treated with emphasis on digital radiography and computer tomography. *Fall.* DiBianca.

252. DIGITAL NUCLEAR IMAGING (3). Prerequisites, BMME 141, BMME 142. Advanced topics of physics and instrumentation in nuclear imaging and nuclear magnetic resonance imaging techniques. *Fall.* Tsui.

259. PICTURE PROCESSING AND PATTERN RECOGNITION (3) (Comp 254). Prerequisites, Math 34, Comp. 14. Theory and practice of picture coding, picture improvement, picture analysis and pattern recognition as applied to pictures. *Spring.* Pizer, Tsui.

280. ROBOTICS (3). Prerequisites, BMME 120, BMME 132. Basic concepts and methods of robot programming, artificial intelligence, machine vision, hierarchical control, and sensory hierarchies, with applications to medical prosthesis and automation of clinical laboratories. *Spring.* Johnson, Coulter.

301. SEMINAR IN BIOMEDICAL ENGINEERING AND MATHEMATICS (1-3). Advanced topics in the field will be covered in depth from one of the following areas: Bioelectricity, Biomechanics, Hemodynamics. Neural Information Processing, Bioacoustics, Biomathematical Models, and Biological Control Systems. Staff.

311. RESEARCH IN BIOMEDICAL ENGINEERING AND MATHEMATICS (Hours to be arranged). Prerequisite, permission of the instructor. Staff.

393. MASTER'S THESIS (Hours to be arranged).

394. DOCTORAL DISSERTATION (Hours to be arranged).

400. GENERAL REGISTRATION (0).

## *Curriculum in Genetics*

Genetics is one of the most rapidly developing fields of modern biology and basic to the understanding of many aspects not only of biology but also of medicine and the future of man. The Curriculum in Genetics was established to provide an integrated and interacting interdepartmental program of study leading to the Ph.D. degree in genetics. The courses open to the students are primarily those of the departments of Anatomy, Anthropology, Biochemistry, Biology, Biostatistics, Chemistry, Microbiology and Pathology. The facilities as well as the talent of those departments are available to students in the Curriculum in Genetics. Types of research being conducted by faculty members of the Curriculum include bacterial and viral genetics, microbial genetics, mutagenesis, immunogenetics, human and medical genetics, biochemical genetics, tissue culture, chromatin structure, behavioral genetics, anthropological genetics, developmental genetics, statistical and population genetics, *Drosophilla* genetics, *Neurospora* cytogenetics, cell biology, and molecular biology. (Although there is a research program in medical genetics, there is not a professional program in genetic counseling or medical genetics).

### *Requirements for Admission to Graduate Work*

Applications will be favorably considered from students with good academic records and interest in careers in genetics research. They should preferably have majored or minored in one of the following disciplines: genetics, biology (zoology or botany), chemistry, microbiology, physics, mathematics, or biophysics. They should have taken calculus and organic and physical chemistry, although these are not absolutely essential. Applicants are accepted to begin their initial studies in the fall. They must apply to both the Graduate School and the Curriculum in Genetics. Graduate Record Examination scores, transcripts of records, and three letters of recommendation (submitted in the Graduate School official form)

should be received soon after the application. Those persons whose application portfolio places them highest on the admission list will be asked to visit Chapel Hill for interviews at their expense. Students are encouraged to apply as early as possible, preferably before January. Master's candidates are not accepted.

*Requirements for the Ph.D. Degree*

Students may receive the Ph.D. degree either in genetics or in one of the departments participating in the curriculum. No minor is required for those majoring in genetics. The requirements concerning a minor for those majoring in a department vary among the participating departments. Graduate students are expected to master one subdiscipline of genetics, but to be sufficiently versed in related aspects of that science. Students work under a research advisor of their choosing, assisted by other faculty members in closely allied branches of genetics.

*Financial Aid*

A limited number of NIH predoctoral fellowships are available. The fellowships carry stipends plus tuition and fees.

*Colloquia/Mini-Symposia*

This format provides a forum for persons interested in all phases of genetics. The colloquia are presented on Fridays at 12:30 p.m. during the academic year by faculty, students, and invited speakers from other institutions.

## PROFESSORS

K. F. BOTT (Chair) (Microbiology)
E. G. BARRY (Biology)
F. J. DESERRES (Adjunct, Pathology)
J. W. DRAKE (Adjunct, Pathology)
M. H. EDGELL (Microbiology)
J. A. FRELINGER (Microbiology)
E. GLASSMAN (Biochemistry)
H. GOODER (Microbiology)
J. B. GRAHAM (Pathology)
G. HAUGHTON (Microbiology)
C. A. HUTCHISON III (Microbiology)
B. H. JUDD (Adjunct, Biology)
H. N. KIRKMAN (Pediatrics)
J. C. LUCCHESI (Biology)
H. V. MALLING (Adjunct, Pathology)
W. S. POLLITZER (Anatomy)
P. F. SPARLING (Microbiology)
D. W. STAFFORD (Biology)
M. R. SWIFT (Medicine)

## ASSOCIATE PROFESSORS

S. L. BACHENHEIMER (Microbiology)
B. W. GLICKMAN (Adjunct, Pathology)
J. GRIFFITH (Microbiology)
G. P. MARONI (Biology)
A. G. MATTHYSSE (Biology)
K. K. NAMBOODIRI (Research, Biostatistics)

J. E. NEWBOLD (Microbiology)
H. M. REISNER (Pathology and Microbiology)
M. A. RESNICK (Adjunct, Pathology)
G. T. WERTZ (Microbiology)

**ASSISTANT PROFESSORS**

J. C. BARRETT (Adjunct, Pathology)
P. J. BASSFORD (Microbiology)
K. S. BLOOM (Biology)
J. G. CANNON (Microbiology)
C.-J.S. EDGELL (Research, Pathology)
B. S. ERREDE (Chemistry)
D. M. FOWLKES (Pathology)
H. M. FRIED (Biochemistry)
C. H. LANGLEY (Adjunct, Biostatistics)
S. T. LORD (Research, Pathology)
P. F. MANESS (Biochemistry)
P. J. PUKKILA (Biology)
M. D. TOPAL (Pathology)

*Courses Offered for Graduate Students*

105. MOLECULAR BIOLOGY (Biochemistry 105) (3). Prerequisites: Biochemistry 100 or equivalent. Mechanisms of replication, transcription, and translation of genetic material in procaryotic and eucaryotic systems, gene sequence and organization, biochemical genetics, and regulatory mechanisms. *3 lecture hours a week. Fall.* Chae, Fried, Sancar.

106. ENZYME KINETICS (Biochemistry 106) (1). Prerequisite: Biochemistry 100 or equivalent. An analysis of enzyme-catalyzed multiple substrate reactions, the kinetic characteristics of allosteric enzymes, and methods for studying control or reaction in intact cells. *Spring.* Jones, White.

108. MOLECULAR AND CELLULAR BASIS OF MICROBIOLOGY (Microbiology 105) (5). Prerequisites: Organic Chemistry, permission of department except for department majors. Basic concepts of the structure, metabolism, growth, and reproduction, genetics and control and regulation of procaryotes and single cell eucaryote systems. *5 lecture hours a week. Fall.* Bachenheimer.

115. GENETICS AND HUMAN EVOLUTION (Anatomy 115, Anthropology 115) (3). Fundamental principles of genetics; population genetics; factors of evolution; race and species formation; evolution of primates and man. The interaction of genetics and culture in human behavior, society, and evolution. *3 lecture hours a week. Spring.* Pollitzer.

122. HUMAN GENETICS (Biology 122) (3). Prerequisite: Biology 53 or equivalent. Applications of traditional and contemporary methods of genetic analysis to matters of human concern; pedigree analysis, population genetics, tissue transplants, immunogenetics, somatic cell genetics, and recombinant DNA in medical applications. *3 lecture hours a week. Spring.* Maroni.

150. ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE (Biostatistics 150) (3). Prerequisite: integral calculus. Fundamentals of probability theory; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. *3 lecture hours a week. Fall and spring.* Biostatistics Staff.

160A. ADVANCED GENETICS: DEVELOPMENTAL (Biology 160A) (3). Prerequisite: Biology 53. The genetic control and molecular basis of gene expression during development. *3 lecture hours a week. Fall or spring.* Lucchesi.

160B. ADVANCED GENETICS: MOLECULAR GENETICS OF EUCARYOTES (Biology 160B) (3). Prerequisites: Biology 53 or permission of instructor. The physical and genetic organization of the genome of higher organisms. Gene expression and its regulation. Discussion of methodologies and specific examples. *3 hours a week. Fall.* Maroni, Pukkila.

160L. ADVANCED GENETICS LABORATORY (Biology 160L) (3). Corequisite: Biology 53. Methods and techniques of developmental and biochemical genetics and cytogenetics. Each student will develop an individual project in the laboratory of one of the instructors. *6 laboratory hours a week. Fall.* Lucchesi, Maroni, Pukkila.

164. MOLECULAR BIOLOGY (Biology 164) (3). Prerequisite: Biology 120 or 121; Chemistry 61, prerequisite or corequisite. The nature, production and replication of biological compounds and their relation to structure and function in development. *3 lecture hours a week. Spring.* Stafford.

170. MUTAGENESIS AND GENETIC TOXICOLOGY (Toxicology 170) (2). Prerequisite: course in general genetics and general biochemistry. A survey of basic mechanisms and mutagenesis, its impact on populations, mutagenicity screening systems and their deployment. *2 lecture hours a week. Spring.* Drake, deSerres.

172. CYTOGENETICS (Biology 172) (3). Prerequisite: Biology 53. Critical study of research papers concerned with the behavior and organization of chromosomes. *3 hours a week. Spring.* (Alternate years). Barry.

173. PLANT GENETICS AND SPECIATION (Biology 173) (3). Prerequisite: Biology 53 or permission of the instructor. Mendelian and molecular genetics of vascular plants, with emphasis on genetic phenomena characteristic of plants and the role of heredity in plant systems. *3 lecture hours a week. Spring.* (Alternate years.) Parks and Matthysse.

189. NUCLEIC ACID TECHNIQUES (Microbiology 189, Biology 189) (4). Prerequisites: some molecular biology, permission of instructor. An intensive course covering many aspects of recombinant DNA technology such as: cDNA preparation, gel analysis, southerns, nick translations, Berk-Sharp analysis, library analysis and DNA sequencing. Fee required. *8 laboratory hours. Spring.* Newbold, staff.

190. EUCARYOTIC GENE ORGANIZATION (Microbiology 190) (4). Prerequisite: Organic Chemistry, permission of instructor. Basic concepts of classical chromosomal structure, function and mechanics. Eukaryotic molecular genetics and cellular regulation will be emphasized. Readings, short answer examinations, term project. *4 lecture hours. Fall.* Bachenheimer.

191. EUCARYOTIC GENE CONTROL (Microbiology 191) (3). Prerequisite: Genetics 190 and permission of the instructor. Current research and possible new approaches to elucidating the mechanisms of eucaryotic gene control will be critically analyzed. *3 lecture hours a week. Spring.* Fowler. (Not taught.)

210. SEMINAR/TUTORIAL IN MICROBIAL CHEMISTRY AND GENETICS (Microbiology 210) (3). One or two faculty and a small number of students will consider in depth current research of importance. Emphasis will be on current literature, invited speakers, etc., rather than textbooks. *3 hours a week. Fall.* Hutchison.

222a. HUMAN GENETICS AND CONSTITUTIONAL PATHOLOGY (Pathology 222) (3½). Prerequisite: permission of the instructor. Includes elementary statistics, basic genetic theory and relevant field work with persons, archives and census records. *2 conference and 6 laboratory hours a week. Fall.* Graham.

240. SPECIAL TOPICS IN GENETICS (2–4). Prerequisite: permission of the instructor. *Fall.* Staff.

241. SPECIAL TOPICS IN GENETICS (2–4). Prerequisite: permission of the instructor. *Spring.* Staff.

249. GENETICS OF COMMON DISEASES (Epidemiology 249) (3). Prerequisite: Biostatistics 150, Genetics 122 or Epidemiology 160, or permission of the instructor. Critical analysis of genetic issues in human disease. The genetics of cancer, heart disease, diabetes, mental illness, mental retardation, hypertension and arthritis will be covered. The application of genetic and epidemiological techniques will be examined. *3 lecture hours a week. Spring.* (Alternate years.) Swift.

270. SEMINAR IN GENETICS (Biology 270) (2). Prerequisite: permission of instructor. *2 seminar hours a week. Fall and spring, on occasion.* Lucchesi, Maroni, Pukkila.

275. GENETICS SYSTEMS (Microbiology 275, Biochemistry 275, Biology 275, Pathology 275) (3). An advanced course in genetics emphasizing the genetics and molecular biology of viruses, bacteria, fungi, insects and mammals and based upon the personal research of the staff. Required of all candidates for the degree in Genetics. *3 lecture hours a week. Fall.* (Alternate years). Staff.

281. STATISTICAL METHODS IN HUMAN GENETICS (Biostatistics 281) (3). Prerequisite: permission of the instructor. An introduction to statistical procedures for genetic counseling, testing genetic hypotheses and estimating genetic parameters from human data. Topics covered include models for monogenic autosomal and X-linkage, mutation and selection, polygenic inheritance. Special emphasis will be given to segregation and linkage analysis. *3 lecture hours a week. Spring.* (Alternate years). Biostatistics staff.

305. RESEARCH IN GENETICS (3 or more). Prerequisite: permission of the instructor. *Throughout the year.* Staff.

350. TRAINING IN GENETICS TEACHING (3). Prerequisite: two courses in genetics and permission of the instructor. Principles of genetics pedagogy. Students will be responsible for assistance in teaching genetics and will work under the supervision of the faculty with whom they will have regular discussion of methods, content and evaluation of performance. *Throughout the year.* Staff.

394. DOCTORAL DISSERTATION (3 or more). *Throughout the year.* Staff.

400. GENERAL REGISTRATION (0).

## *Curriculum in Neurobiology*

The Neurobiology Curriculum of The University of North Carolina at Chapel Hill includes faculty from the departments of Anatomy, Anesthesiology, Biochemistry and Nutrition, Biostatistics, Medicine, Neurology, Oral Biology, Oral Surgery, Pathology, Pharmacology, Physiology, Psychiatry, Psychology, Surgery, Biology and from the Curricula in Genetics, and in Biomedical Engineering and Mathematics. The theme unifying members of these diverse departments is a desire to understand the mechanisms by which the

nervous system functions. While sharing this fundamental interest in the nervous system, research techniques used by members of the Curriculum are quite diverse and provide the student with the opportunity to master a wide variety of laboratory skills.

Graduate students working toward the Ph.D. in Neurobiology must take Neurobiology 101a, 111, 112, 200, 203, 227, 290, and 302, as well as other courses suggested by the Associate Director of Training.

The minor in Neurobiology consists of a minimum of 15 hours of coursework selected from the list below with the approval of the Associate Director for Training.

Special fellowships, commensurate with grants-in-aid, are available to support graduate students who are working toward the Ph.D. degree under the direction of a faculty member in the Neurobiology Program and who major in Neurobiology. After the second year, graduate students are eligible to receive travel awards to attend national meetings.

Inquiries and requests for applications should be addressed to The Graduate School, Bynum Hall 008A, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27514.

## PROFESSORS

P. MORELL (Curriculum Chair) (Biochemistry and Nutrition)

G. R. BREESE (Psychiatry, Pharmacology)

N. A. COULTER (Biomedical Engineering and Mathematics, Physiology)

F. L. ELDRIDGE (Medicine, Physiology)

F. W. ELLIS (Pharmacology)

L. I. GILBERT (Biology)

E. GLASSMAN (Biochemistry and Nutrition)

J. S. HANKER (Oral Biology)

J. N. HAYWARD (Neurology)

O. W. HENSON (Anatomy, Surgery)

R. N. JOHNSON (Neurology, Biomedical Engineering and Mathematics)

R. A. KING (Psychology)

M. R. KRIGMAN (Pathology)

M. A. LIPTON (Psychiatry, Biological Sciences Research Center, Biochemistry and Nutrition)

M. S. MAHALEY, Jr. (Neurosurgery)

R. A. MUELLER (Anesthesiology, Pharmacology)

P. L. MUNSON (Pharmacology)

R. D. MYERS (Psychiatry)

P. A. OBRIST (Psychology)

L. O'TUAMA (Neurology, Pediatrics, Medicine (resigned June 1983)

J. P. PERKINS (Pharmacology)

E. R. PERL (Physiology)

A. J. PRANGE (Psychiatry)

A. RUSTIONI (Anatomy)

P. G. SHINKMAN (Psychology)

W. E. STUMPF (Anatomy, Pharmacology)

B. L. WHITSEL (Physiology, Oral Surgery)

R. H. WILEY (Biology)

J. WILSON (Biochemistry and Nutrition)

## ASSOCIATE PROFESSORS

L. X. CUBEDDU (Pharmacology, Medicine)

L. DYKSTRA (Psychology)

P. B. FAREL (Physiology)

R. L. GLASSER (Physiology)

R. S. GREENWOOD (Neurology, Pediatric Medicine)

T. K. HARDEN (Pharmacology)

H. S. HSIAO (Biomedical Engineering and Mathematics)

J. S. KIZER (Medicine)

J. M. LAUDER (Anatomy)

D. M. LAY (Anatomy)

P. T. LOOSEN (Psychiatry) (resigned 8/31/83)

D. L. MCILWAIN (Physiology)

J. D. MANN (Neurology, Medicine)

G. W. D. MEISSNER (Biochemistry, and Nutrition, Physiology)

R. L. MONTGOMERY (Anatomy)

G. S. OXFORD (Physiology)

T. C. PENG (Pharmacology)

P. PETRUSZ (Anatomy)

A. E. STUART (Physiology)

W. G. THOMAS (Surgery)

. N. WEAKLY (Physiology) (leave of absence)

## ASSISTANT PROFESSORS

R. J. DINGLEDINE (Pharmacology)

M. GALLAGHER (Psychology)

. F. HOWARD, Jr. (Neurology)

. M. MARSHALL (Physiology)

C. D. MCCARTHEY (Pharmacology)

D. E. MILLHORN (Physiology)

J. PRAZMA (Surgery)

R. SEALOCK (Physiology)

## ADJUNCT PROFESSORS

C. L. MITCHELL (Pharmacology) (Chief, Laboratory of Behavioral and Neurological Toxicology, NIEHS)

R. W. OPPENHEIM (Biology)

## ADJUNCT ASSOCIATE PROFESSORS

S. C. BONDY (Pharmacology)

L. D. GRANT (Anatomy)

## ADJUNCT ASSISTANT PROFESSOR

R. C. MACPHAIL (Psychology)

## RESEARCH ASSOCIATE PROFESSORS

G. Y. GILLESPIE (Neurosurgery)

R. B. MAILMAN (Psychiatry, Pharmacology)

M. SAR (Anatomy)

W. W. YOUNGBLOOD (Biochemistry and Nutrition)

## CURRICULUM

*Courses for Graduates and Advanced Undergraduates*

100. BIOCHEMISTRY FOR STUDENTS OF BIOLOGY AND CHEMISTRY (Biochemistry 100, Biology 107) (3). Prerequisite: Chemistry 61 and one course in biology. Lectures on the mechanism and regulation of reactions in living organisms, with emphasis on general principles. Protein structure and enzyme function; central pathways in intermediary metabolism; metabolic control; expression of genetic information; molecular disease. *Fall and spring.* Meissner, Wolfenden.

101a. NEUROANATOMY (Anatomy 101) (5). The central nervous system and organs of special sense. *3 lecture and 4 laboratory hours a week. Spring.* Rustioni.

101c. CONDITIONING AND LEARNING (Psychology 101) (3). Prerequisite: Psychology 10 and 22. A comprehensive survey of the methods, findings, and theories of classical and operant conditioning. Skills necessary to evaluate, integrate and summarize significant original literature will be developed. *Fall.* Dykstra, Eckerman, Waller.

102. BIOLOGICAL FOUNDATIONS OF BEHAVIOR (Psychology 102) (4). Prerequisite: Psychology 22 or Zoology 11. Ethological, genetic and physiological variables will be studied in relation to their behavioral effects. *2 lecture and 3 laboratory hours a week, on occasion.* Staff.

106. PHYSIOLOGICAL PSYCHOLOGY (Psychology 106) (3). Prerequisite: Psychology 10, or a course in Zoology. Elements of neurophysiology, neuroanatomy, and neurochemistry as they apply to the understanding of behavior and conscious experience. *Fall and spring.* Gallagher, King.

110. TECHNIQUES IN PHYSIOLOGICAL PHARMACOLOGY (Pharmacology 110) (3). Prerequisite: Pharmacology 202 and permission of the instructor. Students will learn and perform a variety of physiological techniques often used in classical pharmacological research. *1 lecture and 6 laboratory hours a week. Spring.* (1984 and alternate years). Staff.

111–112. NEUROBIOLOGY LABORATORY APPRENTICESHIP (3–9). Prerequisite: permission of the Director of Training of the Neurobiology Curriculum. A laboratory-tutorial course to acquaint the student with methods used in several areas of neurobiology. *Fall, spring.* Faculty of the Neurobiology Curriculum.

111a. BIOMEDICAL INSTRUMENTATION (BMME 111) (3). Prerequisite: Mathematics 32 or equivalent, permission of the instructor. Designed for students who do not have and want experience in electronics. The fundamentals of circuit, theory of microprocessors and practical circuit design are presented in the context of biological applications. This course includes a laboratory and individual student projects. *Spring.* Hsiao.

113–113L. ANIMAL BEHAVIOR (Biology 73) (3). Prerequisites: Biology 11, 11L, or permission of the instructor. An introduction to animal behavior, including the ontogeny, physiology, ecology and evolution of behavior. *3 lecture and 3 laboratory hours a week. Fall and spring.* Muller, Wiley.

118. NEUROENDOCRINOLOGY (Anatomy 118) (Pharmacology 118) (2). Prerequisite: permission of the instructor. A review of presently held concepts in neuroendocrinology with emphasis on topographical aspects of brain structures related to hormone action. *2 lecture hours a week. Spring.* (1984 and alternate years). Stumpf, Sar.

120. COMPARATIVE PHYSIOLOGY (Biology 120) (3). Prerequisite: Biology 52, 53 or 62 and 1 course in Physiology are recommended. Comparative physiology of the major organ systems with emphasis on common principles underlying homeostasis. *3 lecture hours a week. Spring.* (Alternate years). Koeppe.

120L. COMPARATIVE PHYSIOLOGY LABORATORY (Biology 120L). (1–3). Corequisites: Zoology 120 and permission of the instructor. Instrumentation and techniques in comparative physiology. Hours and credit by prior agreement. *Spring.* Staff.

121. INTRODUCTION TO BIOMEDICAL DATA PROCESSING (BMME 121) (Physiology 121) (3). Prerequisite: Computer Science 16 or equivalent. This is an introduction to the methods of automatic computation of special relevance to biomedical problems. Sampling theory, analog-to-digital conversion, digital filtering will be explored in depth. *Spring.* Lucas.

122. DEVELOPMENTAL NEUROBIOLOGY (Anatomy 122) (3). Prerequisite: permission of instructor. A comprehensive overview of nervous system development including detailed analysis of selected research topics in developmental neuroanatomy. *Spring.* (1985 and alternate years). Lauder.

123. BEHAVIORAL PHARMACOLOGY (Pharmacology 123, Psychology 123) (3). Prerequisites: Pharmacology 202, or Psychology 101 and 106, or their equivalent. Basic principles of pharmacology and the experimental analysis of animal behavior will be considered in relation to drugs that affect the central nervous system. *3 lecture hours a week. Spring.* (1985 and alternate years). Staff.

125. INTRODUCTION TO NEUROPHYSIOLOGY (Biology 125) (3). Prerequisite: Biology 52 or 62 or permission of the instructor. The neurophysiological basis of behavior with emphasis on structure and function of membranes, neurons, synapses, and complex functional units of nervous systems. *3 lecture hours a week, on occasion.* Koeppe.

131. INTRODUCTION TO BIOMATHEMATICS (BMME 131) (3). Prerequisite: Mathematics 32 or equivalent. An introduction to the dynamic analysis of biological systems, including: differential equations of behavior, transient response, Fourier analysis and frequency response, and applications of the LaPlace transform in biology and medicine. *Fall.* Lucas.

140. CELL AND ORGAN SYSTEM PHYSIOLOGY (Physiology 140) (5). Prerequisite: permission of instructor. Principles of cell and organ system physiology suitable for students with a biology and chemistry background. *Fall.* Staff.

150. NEUROBIOLOGY (3). Prerequisite: permission of the instructor. A tutorial in selected topics in neurobiology tailored to meet interests of the students and competencies of instructors. *Fall and spring.* Staff.

200. ADVANCED NEUROPHYSIOLOGY (Physiology 204) (4). Prerequisites: Physiology 140, working knowledge of mammalian neuroanatomy and permission of the course director. A course designed to provide detailed analysis of selected areas of neurophysiology, such as synaptic transmission, sensory and motor systems, and higher integrative mechanisms. *Fall.* Marshall, staff.

201a. EXPERIMENTAL METHODS: CONDITIONING AND LEARNING (Psychology 201) (3). Principal topics include: classical conditioning, operant conditioning, stimulus control of behavior. *Fall or spring.* Staff.

201c. ADVANCED BIOMEDICAL INSTRUMENTATION (BMME 201) (3). Prerequisite: BMME 111 or permission of the instructor. Topics include analysis of medical instrumentation with emphasis on pressure, flow, bioelectric, and ultrasonic transducers. This course includes a laboratory and interfaces microprocessors with transducers. Students are given the opportunity to design and fabricate original devices. *Spring.* Hsiao.

202. BIOLOGICAL PSYCHOLOGY (Psychology 202) (3). Prerequisite: graduate standing in psychology or permission of the instructor. The course will have two parts: a survey of basic brain-behavior relations, (e.g., in perception, learning, and motivation) and survey of topics in applied neuropsychology, including behavioral effects of brain damage, brain mechanisms in language, and normal brain functioning in man. *3 hours a week. Spring.* Staff.

203. SYNAPTIC PHARMACOLOGY (Pharmacology 203) (3). Prerequisite: Pharmacology 202 or permission of instructor. An indepth consideration of biochemical and physiological bases for actions of neuroactive drugs and their possible sites of action in terms of identified pathways and synapses in the brain. *3 lecture hours a week. Fall.* McCarthy, Dingledine, Harden.

204. ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (Psychology 204) (3). Prerequisite: Psychology 106 or equivalent. Each fall one specific topic will be covered in depth, e.g., neural bases of memory storage, homeostasis, and perception. Format will include lecture and seminar meetings with student presentations. *Fall.* Shinkman.

205. ADVANCED BIOLOGICAL PSYCHOLOGY (Psychology 205) (3). Prerequisite: Psychology 106 and or 202, or permission of the instructor. Autonomic nervous system bases of emotion, motivation, and learning. *2 lecture and 2 laboratory hours a week, on demand.* Obrist.

211, 212. SPECIAL TOPICS IN PHYSIOLOGY (Physiology 211, 212) (3–5). Prerequisite: permission of the instructor. Individually arranged programs of study in depth of selected topics, such as membrane function, transport physiology, renal physiology, etc. *Fall and spring.* Staff.

218. EXPERIMENTAL ENDOCRINOLOGY (Biology 218) (2). Prerequisite: permission of the instructor. *6 laboratory hours per week. Spring.* Alternate years. Staff.

220. NEUROPATHOLOGY (Pathology 220) (5). Prerequisite: Pathology 161s and permission of instructor. Systematic study of the more common diseases of the nervous system, utilizing a gross specimen collection, a microscope slide set, current autopsy and surgical specimens, and a histochemical laboratory. *2 conference and 6 laboratory hours a week. Spring and summer.* Krigman, staff.

221. NEURAL INFORMATION PROCESSING (BMME 221) (3). Prerequisites: BMME 131 and Physiology 140 or equivalent. This course approaches the nervous system as a data-processing network, and the brain as the computer for a homeostat. *Spring.* (Alternate years). Coulter.

225. EXPERIMENTAL NEUROPHYSIOLOGY (Biology 225) (3). Prerequisite: permission of the instructor. *6 or more laboratory hours a week, on occasion.* Staff.

227. NEUROCHEMISTRY (Biochemistry 227) (3). Prerequisite: Two semesters of biochemistry. An introductory course in the biochemistry of the nervous system. Topics include aspects of energy metabolism, ion movements, neurotransmitters, intermediary metabolism, and the metabolism of macromolecules in the nervous system. *Fall.* (1984 and alternate years). Wilson, Morell.

235. SEMINAR IN CHEMICAL NEUROBIOLOGY (Biochemistry 235) (3). Prerequisite: 2 semesters of biochemistry. *Fall.* (1985 and alternate years). Wilson, Morell.

259. SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Biology 259) (2). *Fall or spring.* McMahan, Mueller, Wiley.

260. SEMINAR IN COMPARATIVE PHYSIOLOGY (Biology 260) (2). Prerequisite: Zoology 120, or permission of the instructor. *Fall or spring.* Staff.

290. SEMINAR IN NEUROBIOLOGY (Biochemistry 290) (Physiology 290) (Pathology 290) (Pharmacology 290) (3). Prerequisite: permission of the Director of Training of the Neurobiology Curriculum. An intensive consideration of selected topics and problems. Participation required of Neurobiology Trainees. *Spring.* Faculty of the Neurobiology Curriculum.

302. SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (Psychology 302) (3). Prerequisite: permission of instructor. Limited to graduate students in psychology and neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. *Fall and spring.* King, Shinkman, Gallagher.

310. RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Pathology 310) (Pharmacology 310) (Physiology 310) (Psychology 310) (3–12). Prerequisite: permission of a staff member. Research in various aspects of neurobiology. *6 to 24 hours a week. Fall and spring.* Faculty of the Neurobiology Curriculum.

394. DOCTORAL DISSERTATION (0 or more). *Fall, spring, summer.* Research advisor.

400. GENERAL REGISTRATION (0).

# *Curriculum in Toxicology*

The Curriculum in Toxicology administers degree programs leading to the award of the Ph.D. in Toxicology and the M.S. in Toxicology. The curriculum is an interdisciplinary program, and its faculty is drawn from various administrative units of the Schools of Medicine, Pharmacy, and Public Health. The research interests of the faculty include almost all areas of toxicology but major emphases are directed towards: biochemical toxicology, including xenobiotic metabolism; heavy metal toxicology; neurotoxicology, including behavioral toxicology; pulmonary and inhalation toxicology; and carcinogenesis and mutagenesis. The research activities of the Curriculum in Toxicology are conducted in the laboratory facilities assigned to each faculty member by a participating administrative unit.

## *Applications*

Applications for predoctoral studies are considered from students who have received or expect to receive a B.S./B.A. or M.S. degree in a scientific discipline. A desirable background includes courses in biological sciences (including histology and animal physiology), in chemistry (including analytical, organic and physical), and mathematics through calculus, although all of these are not absolutely essential. A strong course in general biochemistry accelerates the student's progress. Applicants are evaluated on the basis of undergraduate (and graduate) academic performance, Graduate Record Examination scores (General Test, and Subject Test if the latter is given in the field of the undergraduate major), and letters of recommendation. Students are accepted on the basis of their achievement and potential. Special circumstances, including prior research experience and publications, are considered in individual cases in the assessment of qualifications for admission. Students are encouraged to proceed for the Ph.D. degree without an intermediate M.S. degree from the Curriculum. The Curriculum will offer a program leading to the M.S. degree only under special circumstances.

*Requirements for the Ph.D. Degree*

The selection of a predoctoral student's graduate courses is influenced by that student's prior academic background. The minimum academic courses which we consider to be desirable for graduate training in toxicology constitute approximately 38 credit hours in didactic courses including biochemistry (two courses), biostatistics, epidemiology, histology, pathology, pharmacology (two courses), physiology, toxicology (special problems) and three elective courses. In addition, each predoctoral student is expected to participate in 12 credit hours of non-didactic training activities, i.e., two semesters of laboratory research experience prior to the doctoral research and four seminars. The satisfactory completion of appropriate courses during the prior academic career permits a student to have a greater latitude in the selection of courses.

A major requirement for the Ph.D. degree is a doctoral dissertation based on the student's independent laboratory research. Written and oral examinations are required in the fields of general toxicology and the major research interest.

*Financial Aid*

The curriculum seeks to fund a limited number of predoctoral students each year. All applicants are considered for financial aid.

## PROFESSORS

T. S. MIYA (Chair) (Pharmacy, Pharmacology)

M. C. BATTIGELLI (Medicine, Environmental Sciences and Engineering)

G. H. COCOLAS (Pharmacy, Medicinal Chemistry)

K. H. DUDLEY (Pharmacology)

D. A. FRASER (Environmental Sciences and Engineering)

J. T. GATZY, Jr. (Pharmacology)

J. W. GRISHAM (Pathology, Medicine)

D. G. KAUFMAN (Pathology, Biochemistry and Nutrition)

M. R. KRIGMAN (Pathology)

A. J. MCBAY (Pathology, Pharmacy)

C. M. SHY (Epidemiology, Environmental Sciences and Engineering, Family Medicine)

B. J. STOVER (Pharmacology)

W. E. STUMPF (Anatomy, Pharmacology)

R. G. THURMAN (Pharmacology)

## ASSOCIATE PROFESSORS

S. G. CHANEY (Biochemistry and Nutrition)

M. FRIEDMAN (Medicine)

A. GOLD (Environmental Sciences and Engineering)

B. GOZ (Pharmacology)

I. H. HALL (Medicinal Chemistry)

C. HARPER (Pharmacology)

D. J. HOLBROOK, Jr. (Associate Chairman) (Biochemistry and Nutrition)

J. D. MANN (Neurology, Medicine)

P. MUSHAK (Pathology)

D. T. POOLE (Pharmacology)

A. G. TURNER, Jr. (Environmental Sciences and Engineering)

## ASSISTANT PROFESSOR

J. H. MAGUIRE (Medicinal Chemistry)

## ESEARCH ASSOCIATE PROFESSORS

. J. HAZUCHA (Medicine)

B. MAILMAN (Psychiatry, Pharmacology)

## DJUNCT PROFESSORS

F. CHIGNELL (Pharmacology)

H. DEAN (Toxicology)

W. DRAKE (Pathology)

. F. DURHAM (Toxicology)

R. FOUTS (Pharmacology)

E. GIBSON (Toxicology)

GOLBERG (Pharmacology, Pathology)

NETTESHEIM (Pathology)

. D. WATERS (Toxicology)

## DJUNCT ASSOCIATE PROFESSORS

R. BEND (Toxicology)

L. S. BIRNBAUM (Environmental Sciences and Engineering)

M. R. BLUM (Pharmaceutics)

T. E. ELING (Toxicology)

B. A. FOWLER (Pathology)

H. d'A. HECK (Toxicology)

G. E. R. HOOK (Toxicology)

J. G. KELLER (Toxicology)

G. W. LUCIER (Biochemistry and Nutrition)

R. P. MASON (Toxicology)

C. M. SCHILLER (Biochemistry and Nutrition)

H. A. TILSON, Jr. (Toxicology)

R. M. WELCH (Pharmaceutics)

F. WELSCH (Toxicology)

## ADJUNCT ASSISTANT PROFESSORS

J. W. ALLEN (Toxicology)

L. W. REITER (Pharmacology)

W. A. WARGIN (Pharmaceutics)

*Courses for Graduates and Advanced Undergraduates*

123. DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Anatomy 123) (2). Review of aspects of development which are particularly susceptible to teratogenic insults; mechanisms by which teratogens affect development. *2 lecture hours per week. Spring.* Anatomy; Johnston, Pratt (Course Codirectors).

142. BIOCHEMICAL TOXICOLOGY (Biochemistry 142) (3). Prerequisite: Biochemistry 100, and one additional biochemistry course (or permission of Coordinator). Biochemical actions of toxicants and assessment of cellular damage by biochemical measurements. Course intended primarily for graduate students. *3 lecture hours per week. Spring.* Biochemistry: Holbrook (Course Director).

150. TOXIC CELL INJURY (Pathology 150) (2). Prerequisite, course(s) in biochemistry, cell biology, and/or pathology. Cell injury by toxins (e.g., heavy metals, chlorinated organic compounds) after acute and chronic exposure. Emphasis on detection of early ultrastructural changes in cell organelles to elucidate mechanisms of toxicity. *1 lecture hour and 1 seminar hour per week. Spring.* (1984 and alternate years). Pathology: Fowler.

170. MUTAGENESIS AND GENETIC TOXICOLOGY (Genetics 170) (2). Prerequisite: Course in general genetics and general biochemistry. A survey of basic mechanism of mutagenesis, its impact on populations, mutagenicity screening systems and their development. *2 lecture hours per week.* Genetics.

*Courses for Graduates*

202. PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Pharmacology 202) (5). Prerequisite: Biochemistry 100, Physiology 140, or their equivalents, and permission of the instructor. Introduces the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. *5 lecture hours per week. Spring.* Pharmacology: Goz (Course Director).

207. RECENT ADVANCES IN TOXICOLOGY (Pharmacology 207) (2). Prerequisite: Pharmacology 202 or permission of the instructor. Recent advances in food additives, cardio-, hepato-, and pulmonary toxicology and the mode of action of radio-nuclides, heavy metals, toxins from plants and animals, solvents and propellants, insecticides, and halogenated hydrocarbons, *2 lecture hours per week. Fall.* Pharmacology: Gatzy (Course Director).

209. BIOTRANSFORMATION OF XENOBIOTICS (Pharmacology 209) (2). Prerequisite: Biochemistry 100 or equivalent or Pharmacology 202 or permission of instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active and/or inactive products. The importance of metabolic pathways to therapy/toxicity. *2 lecture hours per week. Fall.* Pharmacology: Harper, Dudley, Thurman, Fouts.

215. INTRODUCTION TO TOXICOLOGICAL RESEARCH (4). Prerequisite: permission of course coordinator for non-majors. Introductory laboratory experience from research projects of limited scope to acquaint students with the experimental approaches, techniques and equipment of current research in toxicology. *May be repeated. 12 laboratory hours per week. Fall, spring and summer.* Toxicology Faculty.

219. SPECIAL PROBLEMS IN TOXICOLOGY (N.C. State University, Toxicology 590) (2). Orientation to the principles of toxicology (including methodology, risk assessment, and aspects of regulation and socioeconomic issues) as encountered in research institutes, governmental regulatory agencies and industry. Presented at Research Triangle Park by senior scientific staff from Burroughs Wellcome Company, Chemical Industry Institute of Toxicology, Environmental Protection Agency, and National Institute of Environmental Health Sciences. *3 hours per week for 12 weeks. Summer.*

221. SEMINAR IN TOXICOLOGY (1). Prerequisite: permission of course coordinator for non-majors. Student-conducted presentations and discussions of recent advances in toxicology; emphasis on critical evaluation of published investigations and on organization and oral delivery of presentations. *May be repeated up to six times. 1 hour per week. Fall and spring.* Toxicology Faculty.

292. SEMINAR IN CARCINOGENESIS (Pathology 292) (2). Prerequisite: permission of instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. *2 seminar hours per week. Fall.* (1984 and alternate years). Pathology: Kaufman (Course Director).

301. RESEARCH IN TOXICOLOGY (3–9). Prerequisite: permission of course coordinator for non-majors. *May be repeated for credit. Hours and credits to be arranged. Fall, spring and summer.* Toxicology Faculty.

393. MASTER'S THESIS (0–9). *May be repeated. Hours and credits to be arranged. Fall, spring and summer.* Toxicology Faculty.

394. DOCTORAL DISSERTATION (0–9). *May be repeated. Hours and credits to be arranged. Fall, spring and summer.* Toxicology Faculty.

400. GENERAL REGISTRATION (0).

Registration for the following is through Inter-Institutional Registration.

GENERAL PATHOLOGY FOR TOXICOLOGISTS. (Duke University, Pathology 382) (2). Prerequisites: biochemistry, physiology, microbiology and histology or by special permission of the course director. General principles of pathology and pathobiology for graduate students in toxicology who do not have a background in medicine. Principles of cell injury, inflammation, circulatory disturbances, and neoplasia using toxicological principles and models. Presented jointly by faculty members from both Duke University and this University. *Lecture and laboratory hours. Fall.* (1983 and alternate years). Graham (Duke) (Course Director).

# Centers, Divisions and Offices

## *Biological Sciences Research Center*

**Director:** Morris A. Lipton, Ph.D., M.D., Sarah Graham Kenan Professor, of Psychiatry; Professor of Biochemistry.

*Sections and Section Heads:* Biochemical Genetics and Metabolism, H. Neil Kirkman, M.D. (Pediatrics); Child Psychiatry, C. Thomas Gualtieri, M.D. (Psychiatry); Clinical Chemistry, George K. Summer, M.D. (Biochemistry and Nutrition); Developmental and Biochemical Neuroendocrinology, J. Stephen Kizer, M.D. (Medicine and Pharmacology) and William W. Youngblood, Ph.D. (Biochemistry and Nutrition); Division for Disorders of Development and Learning, Harrie R. Chamberlin, M.D. (Pediatrics) and Stephen R. Schroeder, Ph.D. (Psychiatry and Psychology); Medical Genetics, Michael R. Swift, M.D. (Medicine); Neurochemistry, Pierre Morell, Ph.D. (Biochemistry and Nutrition; Curriculum in Neurobiology); Neuropharmacology, George R. Breese, Ph.D. (Psychiatry and Pharmacology); Neurotoxicology, Richard B. Mailman, Ph.D. (Psychiatry and Pharmacology); Psychoendocrinology, Arthur J. Prange Jr., M.D. (Psychiatry).

The Biological Sciences Research Center of the School of Medicine is one of two centers comprising The University of North Carolina Child Development and Mental Retardation Research Institute, an interdisciplinary program of research and training.

The Biological Sciences Research Center, located on the School of Medicine campus, is concerned with biological and medical research in normal and pathological child development. Center programs include research in reproductive physiology, experimental embryology, developmental neuroendocrinology and developmental effects of exposure to environmental pollutants and to long-term drug treatment. Three divisions comprise this center: (1) the Child Psychiatry Division, (2) the Research Division composed of biological and psychological animal and clinical research laboratories, and (3) the Division for Disorders of Development and Learning. The Child Psychiatry Division is concerned with the treatment and management of mentally disturbed children and with research into causes, treatment and prevention of these disturbances. The Research Division includes basic and clinical research on the biology of the developing and retarded central nervous system. The Division for Disorders of Development and Learning is concerned with the development of new techniques for measuring, treating and preventing developmental deficits in the central nervous system and for the training of medical, scientific and paramedical personnel in the diagnosis and treatment of developmentally disabled children.

# *Cancer Research Center*

*Director:* Joseph S. Pagano, M.D., Professor of Medicine and Microbiology and Immunology.

*Associate Director:* H. Shelton Earp, M.D., Associate Professor of Medicine.

*Associate Director, Cancer Control:* Wesley C. Fowler, Jr., M.D., Professor of Obstetrics and Gynecology.

*Assistant Director, Cancer Control:* Shirley P. O'Keefe.

*Program Leaders:* Yung-chi Cheng, Ph.D., Professor of Pharmacology and Medicine (Drug Development), Jeffrey Frelinger, Ph.D., Professor of Microbiology and Immunology (Tumor Immunology), Eng-shang Huang, Ph.D., Associate Professor of Medicine and Microbiology and Immunology (Tumor Virology), Barbara S. Hulka, M.D., Chair and Professor of Epidemiology (Cancer Epidemiology), David Kaufman, M.D., Ph.D., Professor of Pathology and Biochemistry and Nutrition (Chemical Carcinogenesis), W. Jackson Pledger, Ph.D., Associate Professor of Pharmacology (Cancer Cell Biology).

The Cancer Research Center of The University of North Carolina at Chapel Hill was established in 1975 in the School of Medicine. The activities of the Cancer Research Center are interdisciplinary with participation from both basic science and clinical departments of the School of Medicine as well as the Schools of Public Health, Dentistry, Pharmacy, and the Departments of Zoology and Chemistry, and Burroughs Wellcome Company, the National Institute of Environmental Health Sciences and the U.S. Environmental Protection Agency.

Administratively, the center provides staff support for cancer-related activities in program planning, budget management, facilities planning and faculty and staff recruitment. The center acts as the organizational base for cancer-related activities of the Health Sciences Center. The research laboratories are located in laboratories throughout the medical school, and the administrative offices are in the Old Clinic Building. A new Cancer Research Building, The Lineberger Cancer Research Center Building, was occupied in January 1984.

The center is divided into a Basic Science and a Clinical Division. The Basic Science Division operates a centralized tissue culture, glassware and media facility, electron microscope facility, biohazards containment unit, P3 facility for recombinant DNA work, a flow cytometry facility and six major programs. The basic programs of the Center are Tumor Immunology, Cancer Cell Biology, Tumor Virology, Chemical Carcinogenesis, Drug Development and Cancer Epidemiology.

The development of inpatient and interdisciplinary oncology programs is the main activity of the Clinical Division. The research activities are broad with emphasis on the immunology and endocrinology of surgical and gynecologic malignancies and on the pharmacology of anticancer drugs based in the Division of Medical Oncology established with the support of the Cancer Research Center. The Clinical Division also includes a computerized Cancer Data Base designed to provide detailed information on approximately 30,000 patients to researchers, physicians and students. An epidemiology-biostatistics unit and drug-screening resource have recently been organized.

The center's Cancer Control program promotes research in the areas of technology transfer, health education and epidemiology within the state of North Carolina.

The goals of the Cancer Research Center are to provide an organizational framework for a basic Cancer Research Center of regional and national excellence; and to extend new research methods to use where possible for the benefit of patients with cancer in the most up-to-date fashion in cooperation with the Area Health Education Centers of North Carolina.

The curricular goals of the Cancer Research Center are to be implemented through the academic departments. The aims are to provide students a unified view of the molecular and biologic basis for cancer as well as an integrated approach to the understanding of cancer. In addition there is an organized program for the postdoctoral training of basic cancer researchers.

The Cancer Center sponsors a weekly seminar series as well as a Cancer Research Center/Triangle Seminar Series with invited guest scientists of national and international reputation. In addition the center sponsors an annual Postdoctoral Fellow-Faculty Day each fall and a two-day Cancer Symposium each spring with presentations and workshops on a topic of interest to cancer scientists at UNC and the surrounding area. Workshops and minisymposia are also sponsored by the Cancer Center on topics of current interest throughout the year. The center cosponsors a two-day clinical symposium on the latest treatment approaches for cancers in the fall.

## The Center for Alcohol Studies

*Director:* John A. Ewing, M.D., Professor of Psychiatry

*Assistant Director:* Robert D. Myers, Ph.D., Professor of Psychiatry

The Center for Alcohol Studies was established in 1970 with State support and the mandate to coordinate and perform studies related to alcohol, alcoholism and alcoholic offenses. At the present time about 30 faculty members are members of the center and are participating in one or more of 12 interdisciplinary research studies that are being undertaken. These involve workers from the disciplines of anthropology, anesthesiology, biochemistry, biostatistics, child psychiatry, health administration, pharmacology, psychiatry, psychology, sociology and veterinary medicine. The Center facilitates such collaborative studies as well as promotes research communications among interested faculty members and others within and without the University.

## Center for Environmental Health and Medical Sciences

*Director:* Philip A. Bromberg, M.D. (Medicine)

*Associate Director:* Albert M. Collier, M.D. (Pediatrics)

*Program Leaders:* Brian A. Boehlecke, M.D. (Medicine); Johnny L. Carson, Ph.D. (Pediatrics); Mitchell Friedman, M.D. (Medicine); Milan J. Hazucha, M.D., Ph.D. (Medicine); Frederick W. Henderson, M.D. (Pediatrics); Howard R. Kehrl, M.D.; Gary Koch, Ph.D. (School of Public Health); Ted Martonen, Ph.D. (Medicine); J. Randolph Perry, M.D. (Radiology); Venkatachalam Ranga, M.D. (Medicine); Parker Reist, Sc.D. (Public Health); David S. Sheps, M.D. (Medicine); Gerald L. Strope, M.D. (Pediatrics).

The Center for Environmental Health and Medical Sciences of the School of Medicine was established in 1979 and is broadly concerned with environmental and occupational impacts on human health. Multidisciplinary approaches are used to study the effects of inhaled agents on diseased as well as healthy human subjects. The center is particularly concerned in coordinating the responses of university faculty to State and Federal needs in this area and to develop appropriate applied and basic research programs as well as educational and training opportunities in these areas.

The center has administrative offices located in the Medical Building C area and laboratories in Medical Building B as well as access to the sophisticated human and animal environmental exposure facilities of the Inhalation Toxicology Division, U.S. Environmental Protection Agency located on the Chapel Hill campus and in Research Triangle Park. Approximately 30 investigators from several departments in the Schools of Medicine and Public Health are involved in center activities. Many collaborate closely with EPA scientists in various projects.

In addition to grants to individual investigators, the center has general cooperative agreements with the U.S. Environmental Protection Agency and the U.S. Department of Agriculture. The center sponsors a variety of seminars, visiting scientists and research conferences related to basic and clinical studies in environmental health sciences.

## Multipurpose Arthritis Center

*Director:* John B. Winfield, M.D. (Medicine)

*Associate Director:* Suzanne V. H. Sauter, M.D. (Medicine and Rehabilitation Program)

*Director, Research Component:* Robert A. Eisenberg, M.D. (Medicine and Microbiology-Immunology)

*Director, Education Component:* Charles P. Friedman, Ph.D. (Family Medicine and ORDEHP)

*Director, Community Component:* Robert Sakata, Ph.D. (Medical Allied Health Professions)

*Director, Evaluation Core:* Dennis B. Gillings, Ph.D. (Biostatistics, School of Public Health)

In July 1982, the Multipurpose Arthritis Center was established through funding from the National Institutes of Health to conduct innovative research projects and programs in the field of arthritis. Scientists in the Research Component are investigating basic immunologic and clinical questions relevant to the pathogenesis of autoimmune and systemic connective tissue diseases. The Educational Component is developing and testing new educational programs for patients with arthritis and for health professionals in training and practice. The Community Component is interested in arthritis health services research and in model arthritis health care delivery and intervention programs in outlying communities and in industry. The Evaluation Core provides research design, data analysis and other types of statistical advice and consultation to individual projects and to the center as a whole in an effort to increase productivity and to accurately document and interpret the results of the various programs of research being carried out by the Multipurpose Arthritis Center.

## Center for Thrombosis and Hemostasis

*Director:* Harold R. Roberts, M.D., Professor of Medicine and Pathology

The Thrombosis and Hemostasis Research Center was established to promote interdisciplinary research (both basic and clinical), to improve care of patients having diseases related to thrombosis and hemorrhage; and to provide advanced training for young scientists interested in these problems. Diseases related to thrombosis and hemostasis constitute a major health problem throughout the world.

The center has administrative offices in the School of Medicine, and approximately 30 investigators from seven departments in the School of Medicine, the School of Dentistry and the Department of Chemistry are involved in the activities of the center.

In addition to grants to individual investigators, the center has three CORE research grants: a Program Project Grant in Thrombosis and Hemostasis with Dr. John B. Graham of the Pathology Department as Principal Investigator, and a Specialized Center of Research in Thrombosis with Dr. Harold R. Roberts as Principal Investigator. In addition, Dr. Roger Lundblad heads a basic research unit in the Dental Research Center which emphasizes the molecular biology and biochemistry of the coagulation mechanism.

Dr. Graham is also director and Dr. Roberts co-director of a postdoctoral training grant for young investigators, both M.D.'s and Ph.D.'s.

The Center facilitates basic and clinical research in the area of thrombosis and hemorrhage through seminars, conferences, workshops and study groups and coordinates the efforts of multidisciplinary groups attempting to apply basic research findings to clinical situations as quickly as possible.

The Center sponsors, together with the Division of Research in Thrombosis and Hemostasis of the Department of Pathology, weekly seminars on basic and clinical studies. Mini symposia and bi-annual international symposia are sponsored by the Center. Visiting scientists from the United States and other countries regularly participate in the conferences.

## *The Clinical Research Unit*

*Director:* Robert D. Utiger, M.D. (Medicine)

*Associate Director:* David R. Clemmons, M.D. (Medicine and Pediatrics)

*Chairman, Clinical Research Advisory Committee:* Campbell W. McMillan, M.D. (Pediatrics)

The Clinical Research Unit of the School of Medicine, which was opened in January of 1962, provides a setting for the faculty to investigate problems of normal and abnormal physiology of man. It is supported by a grant from the National Institutes of Health of the United States Public Health Service.

The Unit is located within the North Carolina Memorial Hospital, but is a separate facility with its own nursing staff, research dietary services, and laboratories.

The policies of the Clinical Research Unit are guided by the Clinical Research Advisory Committee, a committee of the faculty of the School of Medicine appointed by the Dean.

## Division of Laboratory Animal Medicine

*Director:* James R. Pick, D.V.M. (Pathology)

*Associate Director:* Jerjang Chang, D.V.M., Ph.D. (Pathology)

*Research Assistant Professor:* G. Yancey Gillespie, Ph.D.

*Clinical Veterinarian:* Dwight A. Bellinger (Pathology)

*Clinical Veterinarian:* Richard Rahija, D.V.M.

The Division of Laboratory Animal Medicine provides support for all of the animal-related teaching and research activities conducted by the staff of the School of Medicine. The veterinary staff is also responsible for the humane use and health care of all laboratory animals on the Chapel Hill campus.

The division offers postdoctoral training in laboratory animal medicine to a limited number of qualified veterinarians. A program in comparative pathology is offered in cooperation with the Department of Pathology. Members of the staff are available to answer questions relating to utilization of laboratory animals, and to advise individuals interested in pursuing careers in veterinary medicine. The offices of the division are located in Beryhill Hall.

## Division of Laboratory Medicine

*Director:* William W. McLendon, M.D. (Pathology and Hospital Laboratories)

*Laboratory Directors:* David Miller, M.D., Ph.D. (Pathology–Blood Bank); Harold Roberts, M.D. (Medicine and Pathology); Robert Cross, Ph.D. (Medicine and Pathology–Chemistry); Dennis Ross, M.D., Ph.D. (Pathology-Hematology); James D. Folds, Ph.D. (Microbiology and Immunology); David Chou, M.D. (Pathology Shared Laboratory Services)

The Division of Laboratory Medicine was formed in 1973 as a multidisciplinary division in the School of Medicine for faculty members with a major responsibility in the Department of Hospital Laboratories and in the educational and research activities in laboratory medicine. Currently, there are approximately 20 faculty members with primary and secondary appointments in the Departments of Microbiology and Immunology, Biochemistry, Medicine, and Pathology.

## *Program on Aging*

*Director:* Paul Beck, M.D., Professor of Medicine

*Associate Director:* Carl B. Lyle, M.D., Professor of Medicine

The Program on Aging was established in 1979, with the mandate to develop educational, research and patient care programs in aging in the School of Medicine, as well as in the affiliated Area Health Education Centers of North Carolina. The program coordinates its activities with the Health Sciences Council on Aging on which the deans of the Schools of Medicine, Dentistry, Nursing, Public Health, Pharmacy, and Social Work serve. The Program on Aging is developing service units at the North Carolina Memorial Hospital and at the Wake Area Health Education Center. One of the major goals of these service programs is to evaluate the health, illness, and mobility/dexterity status and rehabilitation potential of the frail elderly.

In cooperation with the Area Health Education Center system, additional programs are under development. Similarly, the AHEC system will serve as an important vehicle for communicating the results of important developments in biomedical and social sciences to physicians who care for the elderly. Thus, the Program on Aging, in conjunction with the AHEC system, offers the potential for the development of multi-center educational, investigational and patient care programs for the elderly.

## *The Program in Molecular Biology and Biotechnology*

*Director:* Marshall Hall Edgell, Ph.D. (Microbiology and Immunology)

*Student Affairs:* Philip L. Carl, Ph.D. (Pharmacology)

*Workshop Coordinator:* John E. Newbold, Ph.D. (Microbiology and Immunology)

The Program in Molecular Biology and Biotechnology was established to promote and coordinate genetic engineering research and education at The University of North Carolina at Chapel Hill. The program encompasses faculty from the entire UNC-Chapel Hill campus. Currently, the major participating degree-granting units are: Microbiology and Immunology, Biochemistry and Nutrition, Biology, Chemistry and Genetics. A major goal of the program is to organize academic activities which will accelerate the diffusion of molecular genetic technology into the research community. As part of this effort, the program has developed a series of degree options designed to train research scientists qualified to operate at the highest levels in either an academic or an industrial setting. The current options are Plant/Nucleic Acids' Recombinant DNA/Microbial Systems and Insect Biology/Genetic Engineering. The program sponsors intensive workshops designed to give students ex-

tensive hands-on experience in DNA cloning and sequencing and in chemical synthesis of DNA, and also sponsors conferences which enable scientists and educators to keep abreast of the latest discoveries and developments in genetic engineering.

## The Robert Wood Johnson Clinical Scholars Program

*Director:* Robert Fletcher, M.D. (Medicine)

*Associate Director:* Eric W. Jenson, M.D. (Psychiatry)

The Robert Wood Johnson Clinical Scholars Program is a two-year fellowship for physicians who have completed clinical training and wish to pursue studies of the effectiveness and efficiency of health services, and how care is selected, organized and financed. Fellows broaden their understanding of medical care through studies of epidemiology, biostatistics, social sciences, economics, management and the humanities. Many pursue advanced degrees, usually in the School of Public Health. Clinical Scholars continue to practice clinical medicine and all are expected to complete research at the interface between clinical medicine and other disciplines. Following their fellowship, Clinical Scholars have taken leadership positions in academic medicine, government and the private sector. The University of North Carolina Clinical Scholars Program is one of six funded by the Robert Wood Johnson Foundation, Princeton, New Jersey.

## Division TEACCH

*Director:* Eric Schopler, Ph.D. (Psychology)

This statewide outpatient program for the Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) is a division in the Department of Psychiatry of the School of Medicine. Comprehensive services are provided to autistic children, adolescents, adults and their families. These services include: diagnostic evaluations, individualized treatment, special classrooms, and parent activities. Both research and professional training, based on this primary service, are important aspects of the program.

Division TEACCH includes administrative and research offices, five clinical centers, and consultative relationships with 40 classrooms and 5 group homes. The administrative and research offices, one clinical center, and one classroom are all located on the School of Medicine campus in Chapel Hill. The other four centers are located in Asheville, Greenville, Charlotte, and Wilmington.

Research has been an important aspect of the program since its beginning as the Child Research Project which demonstrated that parents can indeed be

the most effective cotherapists with their own children. In addition to research involving family life, treatment, and management of autistic and communication handicapped children, Divison TEACCH also studies the biological, behavioral, genetic, biochemical, and language factors in these disorders. Special education approaches, behavior modification techniques, and staff-family interactions are also evaluated.

Division TEACCH is also used for training in various professions. At Chapel Hill, the classroom program offers practicum experience in special education. Practicum and internship are available through the clinical psychology program. Students in child psychology, pediatrics, family medicine, psychology, special education, speech pathology, and child psychiatry have both seminars and clinical experience. In addition, each of the centers offers similar learning opportunities with other universities located in its vicinity. Intensive in-service training programs, workshops, and institutes have been offered with the involvement of TEACCH staff, parents, and children.

The goals of the program are to develop improved adaptation in the three major areas of the client's life, home, school, and community adjustment. The involvement and collaboration of parents is a special focus.

## *Office of Continuing Education*

*Director:* William B. Wood, M.D. (Medicine)

The Office of Continuing Education (located at 231 MacNider Building) is responsible for planning and administration of postgraduate education. The School of Medicine is accredited as an organization for continuing medical education by the Accrediting Council for Continuing Medical Education (ACCME). Education programs are accredited for general medical personnel and medical specialty groups, for Continuing Education Unit (CEU) credits, and other professional groups. These educational programs are located at the University of North Carolina at Chapel Hill, throughout North Carolina as well as nationally, and are implemented through the cooperation of the School of Medicine faculty, Area Health Education faculty and staff and invited guests. Attendance is upon registration and is open to appropriate professional and professionally related persons on an equal opportunity basis.

## *Office of International Affairs*

*Director:* James W. Lea, Ph.D. (Family Medicine)

The Office of International Affairs was established in 1982 to enhance and facilitate international enterprises of medical faculty, residents and students, and to strengthen the international dimension of the School of Medicine. The Office provides planning and information assistance to faculty and students undertaking international research, study and service. It maintains an information data base on current international activities of the School, develops

and promotes new efforts and opportunities, coordinates with other campus entities involved in international affairs, and sponsors or co-sponsors educational or informational events for faculty and students. The Office of International Affairs is located at 208 and 210 North Columbia Street.

## *Office of Research and Development for Education in the Health Professions*

*Director:* Frank P. Stritter, Ph.D. (Family Medicine)

*Associate Director:* Charles P. Friedman, Ph.D. (Family Medicine)

*Associate Professors:* Henry T. Frierson, Ph.D. (Family Medicine); William McGaghie, Ph.D. (Family Medicine)

*Educational Specialists:* Madeline Beery, M.Ed.; Evelyn B. McCarthy, M.A.

ORDEHP, a center for educational research and development, is a resource to the faculty of the School of Medicine. It is an academic unit located within the Dean's office of the School Medicine, established to support and enhance the School's educational mission. ORDEHP faculty and staff members collaborate with basic science, clinical and allied health faculty in such areas as curriculum, instruction, faculty and student development, and student and program evaluation. Educational programs on which ORDEHP concentrates can be classified as undergraduate, graduate and continuing education in several of the health professions. Its mission includes identification of areas where the process of education of health professionals can be studied and thereby improved. ORDEHP both initiates its own programs directed at such needs and supports the programs of other faculty members, divisions or departments. It also collaborates with faculty working on grants and contracts which incorporate educational program development and evaluation as a component.

# *Honors and Awards for the Year 1982–1983*

Students and faculty are recognized annually by selection for awards. Descriptions of the merit scholarships listed below are shown under the Scholarship section of this publication. Other award descriptions follow the listing for 1982–1983.

The Professor Award
John F. Rogers, M.D.
Associate Professor of Medicine

The Medical Basic Science Teaching Award
David B. Jenkins, Ph.D.
Assistant Professor of Anatomy

The CCB Excellence in Teaching Award
Romulo E. Colindres, M.D.
Professor of Medicine

The Henry C. Fordham Award
Rose Gunter Snipes, M.D. '80
Resident in Medicine

The Outstanding Intern Award
Samir M. Fakhry, M.D.
Department of Surgery
Peter D. Mazonson, M.D.
Department of Medicine

Distinguished Service Awards

Jesse B. Caldwell, Jr., M.D.
John A. Cunningham
George L. Jordan, Jr., M.D.
Eszter Kokas, M.D.
Margaret L. Moore, Ed.D.

The Isaac Hall Manning Award
Phillip Sheridan Dickey '83
Christopher George Koeppl '83

The James Bell Bullitt Award
James Charles Osborne '83
Mark Douglas Smith '83

The Medical Faculty Award
Susan Christine Smarr '83

Merit Awards, Class of 1983

Sharon Steele Burton
Douglas Winston Clark
Phillip Sheridan Dickey
Carlton Avery Jenkins
Christopher George Koeppl
Randy Owen Kritzer
Peter John Larson
James Charles Osborne
Andrew Romanowski
Jerry Bryan Sloan
Keith Shatten Thompson
Donald Eugene Toothman

The David A. Mayberry Award
David Linwood Edwards '83

The George C. Thrasher, Jr. Award
Thomas Wyatt Benton '83

| | |
|---|---|
| The Upjohn Award | Phillip Sheridan Dickey '83 |
| The Sandoz Award | Barbara Elizabeth Johnston '83 |
| The Merck Awards | James Alexander Bryan III '83<br>Frank Goulding Keller, Jr. '86<br>Margaret Anne Noel '83<br>Shirley Thompson '83 |
| Mosby Awards | Debra Ann Budwit '86<br>Gregory Dean Parker '84<br>Daniel Seth Shapiro '86 |

American Medical Women's Association Awards, Class of 1983

Cristin Jane Babcock
Gail Shaw Belinsky
Sharon Steele Burton
Catherine Ann Cordero
Marsha Gay Frazelle
Patricia Ann Johnson
Jocelyn Marie Pyles

| | |
|---|---|
| MAP International Fellowship | William John Bicket II '83 |
| The Heusner Pupil Award | Keith Cameron Nichols '84 |
| The William deB. MacNider Award | Majorie Pearsall '85 |

Foreign Fellowships

Amanda Ingham Adler '86
James Porter Alexander '84
James Andrew Bell '84
Steven Joshua Citron '84
Mark David Gershman '85
Stephen Eric Gitelman '84
Margaret Lynn Gulley '84
David Jeffrey Rawlings '84
Michael Sheldon Richardson '86
Barbara LaTowsky Sheline '84
Jonathan Lee Sheline '84
Thomas Earl Shook '84
Stephen Nelson Wall '86
Alan Barry Weiner '84
John Wiley Williams, Jr. '84
Thomas John Zuber '83

Morehead Fellows, Class of 1986

Christopher Llewellyn Karp
Ari Mark Lieman
Jon Pointon Woods

Howard Holderness Fellowships, 1984

Thomas H. Bellhorn '87
Charles Bennett Cairns '86
Charles Louis Saltzman '85
Gregory Wayne Shipp '85
Curtis Lee Sutton '86
Jon Pointon Woods '86
Wilma Jean Wooten '86

Warwick Fellowships, Class of 1985

Valda Oray Gibson
Terrence Dewitt Morton, Jr.

Student Research Day Awards

Michiko Kuno Award — Wayne Russell Rackoff '86
"The Phosphorylation of Hepatic EGF Receptor with cAMP-Dependent Protein Kinase"

Second Award — William Floyd Fleet III '85
"The Effects of Verapamil on Extracellular K+ and pH During Myocardial Ischemia"

Second Award — Pamela Prudence Golden '85
"Production and Partial Characterization of Mouse Monoclonal Antibodies to S-100 Protein"

Second Award — Gwenn Elizabeth McLaughlin '85
"Survey of Transient Erythroblastopenia of Childhood (TEC) in North Carolina"

Second Award — Michael Linn Russell '85
"Experimental Animal Respirator"

Student Research Paper Award

The Judith Joklik Award — Pamela Prudence Golden '85
"A Series of Mouse Monoclonal Antibodies to Bovine S100 Protein: Production, Partial Characterization, and Use in Immunohistochemical Studies."

The W.R. Berryhill Merit Scholarship — James Charles Osborne '83

The Riggins Merit Scholarship — Keith Douglas Herzog '84

Alumni Merit Scholarships

Mett Bagley Ausley '84
William Floyd Fleet III '85
Hilari Lanice Fleming '85
Christopher George Koeppl '83
Donald Eugene Toothman '83
Robert Earl Wiggins '84

## ALPHA OMEGA ALPHA HONOR SOCIETY

*Class of 1983*

President: Phillip Sheridan Dickey

*Cristin Jane Babcock
Thomas Wyatt Benton
Sharon Steele Burton
Stephen Charles Cannon
Donald Wayne Carringer
*Douglas Winston Clark
*Catherine Ann Cordero
*Phillip Sheridan Dickey
George Carlton Finch, Jr.
Marsha Gay Frazelle
*Carlton Avery Jenkins
*Patricia Ann Johnson
*Christopher George Koeppl
*Randy Owen Kritzer
Peter John Larson
*James Charles Osborne
*Andrew Romanowski
*Jerry Bryan Sloan
*Charles Stephen Stinson
Keith Shatteen Thompson
*Donald Eugene Toothman

*Class of 1984*

Barbara Blake Fawcett
Eli David Finkelstein
Michael Evan Garfinkel
Stephen Eric Gitelman
Stephen Davis Harris
Keith Douglas Herzog
Michael Joseph Knight
David Luther Sappenfield
John Martz Schoffstall
Jean Gregory Taylor
Robert Earl Wiggins, Jr.
Michael Nakhleh Zarzar

*Elected junior year

## DESCRIPTION OF AWARDS

*Alpha Omega Alpha*

Gamma Chapter of North Carolina of Alpha Omega Alpha, national medical honor society, was installed at The University of North Carolina School of Medicine in June 1954. A small number of students in the junior and senior classes are eligible for election to membership. Selection is based upon high academic standing, moral character, and promise of future contribution to the field of medicine.

*The William deB. MacNider Award*

The William deB. MacNider Award was established by the second-year class of 1950 and consists of public commendation of a sophomore medical student who is elected by his classmates because he possesses various intangible traits of good character which were typified by Dr. "Billy" MacNider during his 51 years as teacher and physician at The University of North Carolina at Chapel Hill. A plaque hangs in the MacNider Hall and is inscribed each year with the name of the recipient.

*The Isaac Hall Manning Award*

The Isaac Hall Manning Trust Fund was established in 1954, by an anonymous donor, to honor Dr. Isaac Hall Manning, formerly Professor of Physiology and for many years Dean of the School; his service in the School was continuous from 1905 to 1936.

The fund will provide an annual award to the member of the graduating class whom the Dean and the medical faculty may deem especially worthy of honor.

*The C.V. Mosby Company Book Awards*

The C. V. Mosby Company Book Awards are presented annually by the Mosby Publishing Company. These awards consist of the presentation of a current medical book to three outstanding students in the School of Medicine.

*The Deborah Cushing Leary Award*

The Deborah Cushing Leary Award was established in 1958 in honor of the late Dr. Deborah Cushing Leary, Associate Professor of Obstetrics and Gynecology at The University of North Carolina School of Medicine for the period 1952–57. This award is given to the student whose paper is judged by a faculty committee to be the best paper submitted for consideration in the Medical School Student Research Paper Program.

*The Professor Award*

"The Professor" Award was established by the Senior Class of 1956. It consists of a permanent bronze plaque, placed in the Library, to which is added annually the name of the recipient; in addition, each recipient receives an individual, engraved plaque, which is presented on Student-Faculty Day. The inscription of the plaque reads: "This award is presented annually by the graduating class of The University of North Carolina School of Medicine to that faculty member who by his willingness, understanding, and ability has contributed most to our medical education."

*The Henry C. Fordham Award*

This award was established by the Senior Class of 1958 in honor of the late Dr. Henry C. Fordham, Resident in Medicine at the North Carolina Memorial Hospital 1957–1958. The seniors award this annually to a member of the house staff "in recognition of his qualities of patience, humility, and devotion to medicine as were possessed by Dr. Fordham."

*The Intern Award*

In 1963, the junior class selected the intern who had been most helpful to their class and presented him with a book in his specialty. Subsequent classes have continued this practice.

*The James Bell Bullitt Award*

The James Bell Bullitt Award, given for the first time in 1962, honors Dr. Bullitt, formerly Professor of Pathology, who was a member of the faculty of the School of Medicine from 1913 to 1947.

Consistent with the varied contributions of Dr. Bullitt to this School, the award bearing his name is flexible in purpose and provides an opportunity for recognizing unusual achievements or contributions by a member of the senior class.

*The Heusner Pupil Award*

This award was established in 1964 by friends of the late Dr. A. Price Heusner, who was Professor of Surgery from 1952–1956 and then Professor of Anatomy until his death in 1963. A special faculty committee selects the recipient: "A member of the rising fourth-year class who shall show a great capacity to grasp the principles of science, to heal the sick, to comfort the troubled, to be humble before his God."

*The Basic Science Teaching Award*

The Basic Science Teaching Award was established in 1965 by the second-year class to honor a faculty member from the medical basic sciences who has

contributed in a particularly effective and devoted manner to their education. The award reads: "In recognition of his reflection of the joy of learning and his ability to stimulate the critical inquiry and perseverance that are requisite to learning."

*The Merck Awards*

The Merck Awards are presented annually by Merck and Company to four students judged by a faculty committee to be deserving of recognition. The award consists of manuals engraved with the names of the recipients.

*The George C. Thrasher, Jr., Award*

The George C. Thrasher, Jr., Award was established in 1965 by the Department of Psychiatry to be "given annually to that member of the graduating class who, during his medical school experience, shows most outstanding performance and ability in psychiatry." A special committee in the Department of Psychiatry will select a student for recommendation to the faculty committee on awards.

*The Upjohn Award*

In 1969, The Upjohn Company established an award to permit recognition of a graduating senior. The award consists of a check and an engraved plaque. The recipient is selected for distinguished service in student affairs.

*The Medical Faculty Award*

The Medical Faculty Award, established in 1971, is given to the graduating senior who has, in the opinion of the medical faculty, contributed in an outstanding way as a student, scholar, and member of this medical community. Nominations are made and funds contributed by the faculty. Contributions in excess of the $100.00 award are given to the Student Aid Fund in the Dean's Office.

*The CIBA Award*

The CIBA Award, established in 1973, consists of a complete set of the Netter CIBA Medical Illustrations in seven volumes and is given to the sophomore medical student who, in the opinion of the Awards Committee, has contributed most in the area of community service.

*The Central Carolina Bank Excellence in Teaching Award*

An award for $1000.00 for excellence in teaching, established by Central Carolina Bank in 1973, is given to a member of the medical school faculty selected by a vote of the entire school student body. The award alternates each year between basic sciences faculty and clinical faculty, and all members of the medical school faculty are eligible.

*The Michiko Kuno Research Award*

The Michiko Kuno Research Award was established in 1975 in honor of the late Mrs. Michiko Kuno, wife of Dr. Motoy Kuno, Professor of Physiology. The cash award is given to the student whose research paper and presentation at the annual Student Research Day is judged best by a student and faculty committee.

*The Sandoz Award*

The Sandoz Award, established by Sandoz, Inc. in 1975, is given to a fourth year medical student in recognition of superior academic achievement and contribution to health care. The award consists of a check and an engraved plaque.

*The Frank Lee Dameron Award*

The Frank Lee Dameron Award was established by the Class of 1975 in memory of their classmate in recognition both of his achievements as a medical student and of his commitment to return to his hometown in a medically deprived area of the state to practice medicine. The award is given to a member of the third year class who is a student in good standing, committed to practicing primary care medicine at the end of his training program in a rural or medically deprived area of the state. Selection by class ballot is directed by the vice-president of the senior class with the assistance of a designated faculty member and the president of the Whitehead Society. The recipient is announced and the check is presented by the vice-president of the senior class at Student-Faculty Day.

*Judith Joklik Award*

This award was established in 1975 by the family of Mrs. Judith Joklik. The purpose of the $200.00 cash award is to recognize an outstanding contribution in the field of cancer research by a medical student. The recipient will be chosen by the faculty committee which judges papers submitted for consideration in the Medical School Student Research Paper Program. The award is not necessarily given annually but serves to recognize a truly outstanding contribution in this area.

*The David A. Mayberry Award*

The David A. Mayberry Award is given at the time of graduation to a student of the School of Medicine of the University of North Carolina who, during any period of clinical training within the Department of Pediatrics, has demonstrated exceptional human qualities and clinical scholarship in the care of children with cancer. A special faculty committee selects the recipient.

*Foreign Fellowships*

The School of Medicine has a small number of fellowships available to pay for travel expenses and furnish partial support for medical students who wish to have an elective clinical or research experience in another country. One of the fellowships is reserved each year for two students selected for a clinical experience at Warwick Hospital in England. Students who wish to compete for one of the fellowships should submit a proposal to the Student Awards Committee, Office of Student Affairs, stating the type of experience desired, the foreign sponsors, dates and objectives in terms of overall as well as specific goals.

# The Student Roster, 1983–1984

## FIRST YEAR CLASS

*Co-Presidents, Andrea Zita Nowotny and John Perl II*

Mary Lisa Abernethy (Hickory, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Robert Wayne Allen (Durham, NC), East Carolina University, B.S., 1978.

David Bruce Baird (Siler City, NC), University of North Carolina at Chapel Hill, B.S., 1983.

Steven Howard Baker (Pilot Mountain, NC), North Carolina State University, B.S., 1975; B.A., 1982.

Thomas H. Belhorn (Chapel Hill, NC), Ohio State University, B.S., 1979.

John Mark Bennett (Forest City, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Dorene Lanette Bigelow (Mebane, NC), University of North Carolina at Chapel Hill, B.S., 1982 (leave of absence 1983–1984).

William Stephen Blau (Raleigh, NC), State University of New York at Stony Brook, B.S., 1973, Cornell University, Ph.D., 1978.

Charles Arthur Bolick (Conover, NC), Wake Forest University, B.A., 1982.

Bruce Stephen Boliek (Hickory, NC), University of North Carolina at Chapel Hill, B.A., 1983.

David Warner Boone (Raleigh, NC), Davidson College, B.S., 1983.

Mark Branch III (Raleigh, NC), Massachusetts Institute of Technology, B.S., 1983.

Victoria Joy Brand (High Point, NC), Central Wesleyan College, B.A., 1983.

Douglas Garrett Briggs (Raleigh, NC), University of Tennessee at Knoxville, B.A., 1983.

Jacqueline Francoise Bromberg (Chapel Hill, NC), Brandeis University, B.A., 1983.

Charles Jacob Brown (Yadkinville, NC), Oberlin College, B.M., 1977; B.A., 1978; Yale University, M.M., 1981.

Billy Lee Buff, Jr. (Winston-Salem, NC), Wake Forest University, B.A., 1983.

Melissa Ward Burch (Chapel Hill, NC), Swarthmore College, B.A., 1981.

Virginia Harrison Burns (Charlotte, NC) University of North Carolina at Chapel Hill, B.A., 1979.

Scott Eugene Campbell (Sanford, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Michael Bryan Caveness (Raleigh, NC), North Carolina State University, B.S., 1982; B.A., 1983.

James Michael Chimiak (Wilmington, NC), United States Naval Academy, B.S., 1979.

Charles Jihun Chung (Rocky Mount, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Figen Ciloglu (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Carolyn Clark (Fayetteville, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Gregor George Cleveland (Greensboro, NC), Louisiana Polytechnic Institute, B.S., 1970; Rice University, M.A., 1973; Ph.D., 1975.

David Allen Coggins (Arden, NC), North Carolina State University, B.S., 1983.

James Belknap Collawn (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Melissa Suzanne Conrad (Statesville, NC), University of Virginia, B.A., 1983

Carey Gordon Cottle (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Steven Thomas Coulter (Red Bank, NJ), Brown University, B.S., 1983.

James Earl Crowe, Jr. (Winston-Salem, NC), Davidson College, B.S., 1983.

Denise Elaine Crute (Durham, NC), Duke University, B.S., 1983

Leon Entea Dantzler (Fayetteville, NC), Duke University, B.S., 1983.

Keith Edward Davis (Forest City, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Marjorie Faith Davis (Climax, NC), University of North Carolina at Greensboro, B.A., 1982.

Ruth Ann Dickinson (Asheville, NC), University of North Carolina at Asheville, B.A., 1982.

Adrian Cedric Douglass (Elizabeth City, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Ira Gordon Early, Jr. (Winston-Salem, NC), Emory University, B.S., 1981.

James Eugene Edwards (Candler, NC), East Carolina University, B.S., 1973; Western Carolina University, M.S., 1978.

William Gavin Elliott (Charlotte, NC), University of North Carolina at Charlotte, B.S., 1980.

Sara Thornburg Evans (Webster, NC), Florida State University, B.M., 1976; M.M., 1978.

Victor Steven Ferrari (Charlotte, NC), Davidson College, B.S., 1983.

Daniel Scott Fidler, (Park Ridge, IL), Wheaton College, B.S., 1983.

Daniel Sommers Frank (Los Angeles, CA), University of California at Los Angeles, B.S., 1983.

Shawn Austin Gerald (Lumberton, NC), Harvard University, B.A., 1983.

Ruth Ellen Gettes (Chapel Hill, NC), Tufts University, B.S., 1978.

Louise Lochrane Grant (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1979 (leave of absence 1983–1984).

Michael Lee Green (Freehold, NJ), Bucknell University, B.A., 1983.

Jama Bland Greene (Raleigh, NC), Davidson College, B.S., 1983.

J. Lewis Gregory (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1982.

James Small Hagood (Charleston, SC), University of North Carolina at Chapel Hill, B.A., 1983.

James Richard Hallman (Lincolnton, NC), Duke University, B.S., 1983.

Everette Bernard Hambric (Troy, NC), Pembroke State University, B.S., 1974; North Carolina A & T State University, M.S., 1979.

Allen Willard Hamrick (Winston-Salem, NC), Wake Forest University, B.A., 1983.

Gerrie Michelle Hand (Rocky Point, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Elizabeth Anthony Harlan (Durham, NC), University of Virginia, B.A., 1982.

Patricia Ann Harriman (Charlotte, NC), University of North Carolina at Charlotte, B.S., 1982.

Beverly Matthews Harrington (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.S., 1982.

William Stuart Hartley (Statesville, NC), University of North Carolina at Chapel Hill, B.A., 1983.

John Franklin Hatchett (Greensboro, NC), North Carolina A & T State University, B.S, 1983.

Hratchia Vazgen Havoundjian (Los Angeles, CA), University of California at Los Angeles, B.A., 1982.

Mark John Sherman Heath (New York, NY), Harvard University, B.A., 1983.

Darrell Ernest Hester (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Esther Althea Hill (Durham, NC), Spelman College, B.S, 1982; University of North Carolina at Chapel Hill, B.S., 1983.

Nancy Melinda Hill (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Albert Richard Hinn, Jr. (Wilmington, NC), North Carolina State University, B.A., 1983.

James Philmon Hooten, Jr. (Wilmington, NC), Davidson College, B.S., 1983.

Susan Kathleen Hovey (Greensboro, NC), Duke University, B.S., 1982.

May Yimei Huang (Louisville, KY), University of Virginia, B.A., 1983.

Richard Page Hudson III (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Dudley Allen Hudspeth (Winston-Salem, NC), Duke University, B.A., 1981.

Miriam Virginia Hughes (Winston-Salem, NC), Wake Forest University, B.A., 1983.

Susan Foster Isbey (Durham, NC), Duke University, B.S., 1979.

Dennis Neill Jacokes (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Robert Lee Jobe (Enfield, NC), University of North Carolina at Chapel Hill, B.S., 1983.

Alfreda Jones (Maxton, NC), Pembroke State University, B.S., 1982.

Constance Carpenter Jones (Hinsdale, IL), Dartmouth College, B.A., 1982.

James Gregory Kaufman (Winston-Salem, NC), Davidson College, B.S., 1983.

William Walter King (New Bern, NC), Davidson College, B.S., 1983.

David Aryeh Klein (Chapel Hill, NC), University of Rhode Island, B.A., 1974; University of North Carolina at Chapel Hill, M.A., 1979.

Dennis Demosthenes Kokenes (Charlotte, NC), Duke University, B.S., 1983.

Bret Alan Kort (Glenview, IL), Calvin College, B.S., 1983.

Catherine Mary Kuhn (Charlotte, NC), University of North Carolina at Charlotte, B.S., 1980.

Kimberly Kylstra (Durham, NC), Dartmouth College, B.A., 1983.

Thomas Earl Lawrence (Durham, NC), University of North Carolina at Chapel Hill, B.S., 1983.

William Joseph Leland (Matthews, NC), University of North Carolina at Chapel Hill, 1983.

Edward Ben Leof (Chapel Hill, NC), Purdue University, B.S., 1976; University of North Carolina at Chapel Hill, Ph.D., 1982 (leave of absence 1983–1984).

Steven Robert Leventhal (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1982.

James Joseph Lockwood (Lexington, NC), Davidson Community College, A.S., 1978; North Carolina A & T State University, B.S., 1982.

Wylie Donald Lowery, Jr. (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Julia Ogden Lunsford (Burlington, NC), University of North Carolina at Chapel Hill, B.A., 1975.

Gustav Charles Magrinat (Greensboro, NC), Harvard University, B.A., 1969.

Paul Joseph Mainella (Charlotte, NC), Davidson College, B.S., 1983.

Harold Luther Martin, Jr. (High Point, NC), Davidson College, B.A., 1983.

Thomas Fleming Mattox (Wilson, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Jayne Patrice Maynor (Pembroke, NC), Pembroke State University, B.S., 1983.

Melinda Louise McCord (Durham, NC), Wellesley College, B.A., 1979.

Julia Winn McCutcheon (Durham, NC), University of North Carolina at Chapel Hill, B.A., 1973.

Cary Crane McDonald (West End, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Thaddeus Leverne McDonald III (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1973; Duke University, M.Div., 1977.

Marsden Hamilton McGuire (Los Angeles, CA), Yale University, B.A., 1978.

James Willard Melton, Jr. (Rockingham, NC), Wake Forest University, B.A., 1983.

Teresa Ann Melvin (Chapel Hill, NC), Southeastern Community College, A.S., 1980; University of North Carolina at Chapel Hill, B.A., 1982.

James Mitchell Merritt (Rose Hill, NC), St. Andrews Presbyterian College, B.A., B.S., 1983.

Douglas Eugene Mesler (Andover, MA), Duke University, B.A., 1982.

Carlton David Miller (Charlotte, NC), University of North Carolina at Chapel Hill, B.A. 1983.

Timothy Joe Misenheimer (Lexington, NC), University of North Carolina at Greensboro, B.A., 1978.

Rex Jason Moody (Greensboro, NC), University of North Carolina at Chapel Hill, B.S., 1983.

Melisa Dara Moore (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Peter Ray Muller (Raleigh, NC), University of Vermont, B.A., 1981.

Lisle Marie Nabell (Huntersville, NC), Duke University, B.S., 1982.

Douglas Alan Nelson (Chapel Hill, NC), Stanford University, B.A., 1983.

William Ward Nichols (Durham, NC), Duke University, B.A., 1979.

Andrea Zita Nowotny (Merion, PA), University of Pennsylvania, B.S., 1982.

Rajiv Dhruv Pandya (Raleigh, NC), University of North Carolina at Chapel Hill.

Thomas Erik Paulson (Raleigh, NC), North Carolina State University, B.S., 1983.

John Perl II (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1981.

John Michael Petitto (Edenton, NC), Eckerd College, B.S., 1979.

Herbert Charles Pfaff (Tobaccoville, NC), Virginia Polytechnic Institute, B.S., 1980.

Nancy Welcome Phifer (Morganton, NC), Converse College, B.A., 1972.

Sharon Lynn Quarfordt (Durham, NC), Duke University, B.A., 1983.

Linda Marie Raines (Matthews, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Dennis Walter Regan (Los Angeles, CA), University of California at Los Angeles, B.A., 1978.

John David Regan (Lexington, NC), Wake Forest University, B.A., 1978; University of Louisville, M.S., 1980; Duke University, M.B.A., 1983.

Mark Kenneth Robbins (Morgantown, WV), Gettysburg College, B.A., 1983.

Joseph Baxter Roberson, Jr. (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Bennie Dwayne Roberts (Warsaw, NC), University of North Carolina at Chapel Hill, B.A., 1983.

Joseph Earl Roberts, Jr., (Pembroke, NC), Davidson College, B.S., 1983.

Mary Susan Roberts (Asheville, NC), Davidson College, B.A., 1982.

David Benjamin Robinson (Charlotte, NC), Oberlin College, B.A., 1983.

Young Rochelle, Jr. (Greensboro, NC), North Carolina A & T State University, B.S., 1982.

Heather Hall Rohrer (Raleigh, NC), University of North Carolina at Charlotte, B.C.A., 1974.

Charles Alan Ross (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1980.

John Robinson Saltzman (Providence, RI), Tufts University, B.S., 1983.

Daniel Mark Sappenfield (Fayetteville, NC), Davidson College, B.S., 1983.

Marc Scott Schwartzberg (Neenah, WI), Emory University, B.A., 1983.

Henry Lawrence Shapiro (Roslyn Heights, NY), Haverford College, B.A., 1980.

Ronald Bruce Shapiro (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1977.

David Lamon Sheppard (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1981.

David James Sheridan (Charlotte, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Roger Scott Sherman (Asheville, NC), Antioch University, B.A., 1982.

William Reginald Sigmon, Jr. (Hickory, NC), Wake Forest University, B.A., 1983.

Frances Owle Smith (Whittier, NC), Western Carolina University, B.S., 1983.

Stephanie Elaine Spottswood (Cincinnati, OH), University of Michigan, B.A., 1972; University of North Carolina at Chapel Hill, M.S., 1978.

Eve Garlington Spratt (Charlotte, NC), Florida State University, B.A., 1979.

Robyn Lee Stacy (Cary, NC), Wake Forest University, B.S., 1983.

Jeffrey Whitcomb Stolz (McLean, VA), University of Virginia, B.A., 1983.

Brian Scott Strauss (Hillsborough, NC), University of North Carolina at Chapel Hill, B.A., 1983.

William Roger Sutton (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.S., 1983.

Richard Crewley Tarvers (Chapel Hill, NC), University of Massachusetts, B.S., 1976; University of North Carolina at Chapel Hill, Ph.D., 1982.

Roderick O'Hara Thompson (Durham, NC), Massachusetts Institute of Technology, B.S., 1982.

Ellis Allan Tinsley, Jr., (Wilmington, NC), Davidson College, B.S., 1983.

Quang Thanh Tran (Cullowhee, NC), Fayetteville Technical Institute, A.S., 1979; Western Carolina University, B.S., 1980.

Michael Robert Tranfaglia (East Boston, MA), Harvard University, B.A., 1982.

Obinnaya Chiegeiro Umesi (Fayetteville, NC), Shaw University, B.S., 1980.

Robert Michael Walasin (Jacksonville, NC), Westchester Community College, A.A.S., 1976; Mercy College, B.A., 1977; University of Bridgeport, M.S., 1979.

Alene Howard Waller (Chapel Hill, NC), University of Virginia, B.S., 1977.

David Clark Ward (Pittsboro, NC), Dartmouth College, B.A., 1965; Florida State University, Ph.D., 1971.

Mary Kay Washington (Chapel Hill, NC), Mississippi State University, B.S., 1976; University of North Carolina at Chapel Hill, Ph.D., 1982.

Jonathan Jay Weiner (Durham, NC), Duke University, B.S., 1977.

Leah Kae Weyerts (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1975; Duke University, M.A.T., 1978.

Lee Furlong Williams (Chapel Hill, NC), Duke University, B.A., 1970; Boston University, M.Ed., 1972.

Ralph Steven Wiseman (Fallston, NC), East Tennessee State University, B.S., 1976; Medical College of Georgia, B.S., 1979.

Lisa Kay Wroblewski (Durham, NC), Duke University, B.A., 1981.

Paul Albert Young (Fayetteville, NC), North Carolina State University, B.S., 1983.

Jean Elizabeth Zula (Durham, NC), North Carolina Central University, B.S., 1982.

## SECOND YEAR CLASS

*President: Larkin Tyler Wadsworth III*

Charles Martin Adcock (Roxboro, NC), University of North Carolina at Chapel Hill, B.S., 1980 (leave of absence 1983–1984).

Amanda Ingham Adler (Santa Monica, CA), University of California at Davis.

Mary Elizabeth Allen (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Lisa Marie Amaya (Durham, NC), College of William and Mary, B.S., 1982.

Pamela Anne Atkinson (Greensboro, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Mary Elizabeth Balsley (Reidsville, NC), University of North Carolina at Chapel Hill, B.A., 1976.

Evan Scott Bates (Greensboro, NC), Emory University, B.A., 1982.

Steven James Baumrucker (Highlands, NC), University of North Carolina at Chapel Hill, B.A., 1977.

Joseph Tyron Bell (Pembroke, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Andrew Steven Blum (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1980 (leave of absence, 1983–1984).

Tawanda Ann Bowden (Mt. Olive, NC), East Carolina University, B.S., 1982.

William Arthur Branner III (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1982.

James Lancaster Bridgeman, Jr. (Charlotte, NC), Wofford College, B.S., 1981.

Martin Todd Brown (Dunwoody, GA), University of North Carolina at Chapel Hill, B.A., 1981.

Richard Earl Brownlee (Kinston, NC), North Carolina State University, B.A., 1980.

Debra Ann Budwit (South Weymouth, MA), Duke University, B.H.S., 1981.

Kim Allison Buliock (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1980 (leave of absence, 1983–1984).

Richard Andrew Burgoyne (Kinston, NC), Marietta College, B.S., 1979.

Ronald Dean Butler (Roseboro, NC), East Carolina University, B.S., 1981.

Charles Bennett Cairns (Chapel Hill, NC), Dartmouth College, B.A., 1982.

Mark Andrew Callahan (Southern Shores, NC), University of Virginia, B.A., 1979.

Michael Delane Carter (Raleigh, NC), Emory University, B.S., 1982.

Philippa Ann Charlton (Cary, NC), Duke University, B.A., 1980.

James Whitney Cheek (Asheville, NC), Davidson College, B.S., 1982.

John Tao-Fan Chen (Durham, NC), Duke University, B.S., 1980.

Hersh Chopra (Greensboro, NC), Duke University, B.A., 1982.

William Matheson Clark (Jackson, TN), Southwestern at Memphis, B.S., 1981.

Robert Bryan Conley (Chapel Hill, NC), Dartmouth College, B.A., 1982.

Mary Patricia Corr (Chapel Hill, NC), Massachusetts Institute of Technology, B.S., 1982.

Jennifer Preston Coursen (Eugene, OR), University of Pennsylvania, B.A., 1978.

Angela Faye Crisp (Morganton, NC), Duke University, B.S., 1982.

John David Crompton (Asheville, NC), University of North Carolina at Asheville, B.S., 1982.

Timothy Brian Cummings (Wrightsville Beach, NC), Vanderbilt University.

Dennis John Darcey (Chapel Hill, NC), Holy Cross College, B.A., 1975.

Michael Anthony Dawes (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Stephen Edgar Deal (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Lisa Faye DeJarnette (Cary, NC), University of North Carolina at Chapel Hill, B.S., 1979.

Anne Chase Dennison (Wrightsville Beach, NC), Wake Forest University, B.S., 1980.

Anthony Joseph DiNome, Jr. (Bronx, NY), University of North Carolina at Chapel Hill, M.S., 1980.

Betty Schnur Donskoy (Las Vegas, NV), Occidental College, B.A., 1975.

Deborah Renee Doster (Wilson, NC), Wake Forest University, B.A., 1981.

Elizabeth Ann Earp (Shallotte, NC), Meredith College, B.S., 1982.

Kenneth Raynor Ellington (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Alton Maurice Elliott (Hope Mills, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Donald Herman Falk (Raleigh, NC), University of North Carolina at Chapel Hill, B.S., 1976.

William Floyd Fleet III (Brentwood, TN), University of North Carolina at Chapel Hill, B.A., 1981 (leave of absence 1983–1984).

Jorge Luis Franco (Fayetteville, NC), University of North Carolina at Charlotte, B.A., B.S., 1982.

Judie Lynne Garrison (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Elizabeth Valerie Getter (New Rochelle, NY), Brown University, B.A., 1981.

Laurie Elizabeth Gianturco (Durham, NC), Bryn Mawr College, B.A., 1982.

Harold Hett Gillum (Perry Point, MD), University of Maryland at College Park, B.S., 1980.

Herman Colride Gist, Jr. (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1981.

David Calvin Goff, Jr. (Rocky Mount, NC), Duke University, B.S., 1982.

Susan Sanderson Gore (Wilmington, NC), University of North Carolina at Greensboro, B.S., 1975.

Wayne Thomas Gossman (Shalimar, FL), Lenoir-Rhyne College, B.S., 1982.

Todd Worthington Gothard (Durham, NC), Gannon University, B.S., 1982.

Elton Lewis Grant (Miami, FL), Duke University, B.S., 1982.

Jay Michael Griffith (Kinston, NC) University of North Carolina at Chapel Hill, B.A., 1982.

Robert Bruce Gunn (Winston-Salem, NC), North Carolina State University, B.S., 1982.

Paul Hagan (Jacksonville, NC), Winston-Salem State University, B.S., 1982.

Amy Leigh Hair (Fayetteville, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Rebecca Elaine Hall (Hudson, NC), Appalachian State University, B.S., 1982.

Pamela Gayle Hanna (Gastonia, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Connie Dunkley Harrill (Roxboro, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Kelvin Crews Harris (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

John Rucker Henson (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Bruce Elliot Herman (Bryan, OH), University of North Carolina at Chapel Hill, B.A., 1982.

Paul Kevin Hiatt (Winston-Salem, NC), Brigham Young University, B.S., 1982.

Holly Ann Hill (Charlotte, NC), Princeton University, B.A., 1982.

Geoffrey William Hilliard (Whitsett, NC), University of North Carolina at Chapel Hill, M.S., 1982.

Daniel Brian Hoch (Chapel Hill, NC), Whitman College, Purdue University, University of North Carolina at Chapel Hill.

Lisa Ann Hogan (Raleigh, NC), University of North Carolina at Chapel Hill, B.S., 1982.

James Martin Hood (Trenton, NC), University of North Carolina at Chapel Hill, B.A., 1982.

William David Hoover, Jr. (High Point, NC), Davidson College, B.S., 1982.

Elizabeth Claire Huber (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Albert Denning Hudson (Shelby, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Debra Kay Hunt (Hutchinson, KS), University of Kansas, B.S., 1978.

James Curtis Jacobs (Taylorsville, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Cheryl Lynette Jeffries (Burlington, NC), Duke University, B.A., 1982.

Paul Edward Johnston (West Hartford, CT), Massachusetts Institute of Technology, B.S., 1971; M.S., 1975.

Kim Richard Jones (Middleton, WI), Florida State University.

Walton Kitchin Joyner, Jr. (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Christopher Llewellyn Karp (Madison, WI), Brandeis University.

Frank Goulding Keller, Jr. (Hendersonville, NC), University of North Carolina at Asheville, B.A., 1981.

Rebecca Smith Kennedy (Annapolis, MD), Duke University, B.S., 1980.

Karen Kay King (Durham, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Suzanne Lee Kirby (Matthews, NC), North Carolina State University.

Patricia Crea Larocco (Pineville, NC), Immaculata College, B.S., 1971.

Georgia Sue Latham (Glade Valley, NC), West Chester State College, B.A., 1980.

Joseph Wayne Lee, Jr. (Angier, NC), North Carolina State University, B.S., 1981.

Jonathan Keith Levine (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Jennifer Gaye Levitt (Durham, NC), Carleton College, B.A., 1978.

Ari Mark Lieman (New York, NY), Harvard University, A.B., 1982.

James Randall Long (Salisbury, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Lily Joan Lou (Durham, NC), University of California at Davis, B.S., 1979.

Karen Helene Lucovsky (Cary, NC), North Carolina State University, B.S., 1981 (leave of absence, 1983–1984).

Albert Hung-pei Luh (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Sidney Mallenbaum (Greenville, NC), McGill University, B.S., 1982.

David Tupper Manly (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Leslie Cheryl McKinney (Reidsville, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Al Leodus Melvin (Chapel Hill, NC), University of North Carolina at Chapel Hill.

Jean Allen Melvin (Elizabethtown, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Ronnie Levester Melvin (Durham, NC), Cornell University, B.S., 1979.

Patricia Ann Michael (Raleigh, NC), University of North Carolina at Chapel Hill, Ph.D., 1982.

Charles Griffith Miller (Asheville, NC), Erskine College, B.A., 1981.

Eric Wesley Miller (Winston-Salem, NC), Harvard College, B.A., 1980.

Michael Ray Miller (Statesville, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Yvonne Lee Monroe (Carrboro, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Frederick Patton Moore (Winston-Salem, NC), Hampton Institute, B.S., 1979.

Sherry Lynn Morris (Durham, NC), University of Maryland, B.S., 1980.

Michael Moyer (Carrboro, NC), North Carolina Central University, B.S., 1978.

Michael Elliott Norins (Hot Springs, NC), University of South Carolina, M.P.H., 1977.

Francine Annette Olds (Chesapeake, VA), University of Virginia.

Steven R. Olson (Melville, NY), State University of New York at Albany, B.S., 1982.

Sergio Francisco Orellana (Greenville, NC), East Carolina University, B.S., 1981.

Rita Panoscha (Tryon, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Kenneth Thomas Patterson (Farmville, NC), Davidson College, B.S., 1979.

David Christopher Pearce (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1978.

Mark Daniel Pegram (Raleigh, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Robert Clay Pennington, Jr. (Reidsville, NC), University of North Carolina at Chapel Hill, M.S., 1980.

Mark David Plunkett (Raleigh, NC), Duke University, B.S., 1982.

Jorge Plutzky (Gainesville, FL), University of Virginia, B.A., 1981.

William Griffin Price (Carrboro, NC), Duke University, B.S., 1972.

Rodney Vance Pugh (Burlington, NC), North Carolina State University, B.S., 1982.

Wayne Russell Rackoff (Miami, FL), University of North Carolina at Chapel Hill, Ph.D., 1982.

John David Reed (Kings Mountain, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Mark Clement Remington (Philadelphia, PA), University of Pennsylvania, B.A., 1974.

Joel Douglas Rice (Durham, NC), Hampshire College, B.A., 1981.

Michael Sheldon Richardson (Hendersonville, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Bradley William Robinson (High Point, NC), Brown University, B.S., 1982.

Grayson Knox Rodgers (Advance, NC), University of North Carolina at Chapel Hill.

James Grooms Ross (Rockingham, NC), North Carolina State University, M.S., 1981.

Deborah Olive Russell (Pittsboro, NC), Georgia State University, B.S., 1973.

Carolyn Marie Sampson (New Bern, NC), East Carolina University, B.S., 1981.

Tobias Schifter (Charlotte, NC), University of North Carolina at Charlotte, B.S., 1981.

Deborah Ann Schwengel (Chapel Hill, NC), Duke University, B.S.N., 1977.

Harsha Ananda Sen (Wilson, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Daniel Seth Shapiro (Great Neck, NY), Massachusetts Institute of Technology, B.S., 1981 (leave of absence, 1983–1984).

Beverley Jeanne Sheares (Clayton, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Timothy Scott Smyth (Westbrook, ME), University of Maine at Orono, B.S., 1981; University of Florida.

Carl Wilson Sofley, Jr. (Cary, NC), Davidson College, B.S., 1982.

John Given Spangler (Greensboro, NC), Davidson College, B.A., 1982.

Angela Jolene Stanley (Belhaven, NC), University of North Carolina at Chapel Hill, B.S., 1982.

David William Sundheimer (Cary, NC), University of Arizona, Ph.D., 1979.

Curtis Lee Sutton (Kinston, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Jean Elizabeth Talbert (Floral Park, NY), Oberlin College, B.A., 1978.

Elizabeth Sue Talley (Charlotte, NC), University of North Carolina at Charlotte, B.S., 1982.

Deborah Jane Timmons (Chapel Hill, NC), Sarah Lawrence College, M.S., 1978.

Jo Marlene Travis (Raleigh, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Jim Boyce Tucker (Goldsboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Beverly Jane Waddell (Greensboro, NC), Hampton Institute, B.A., 1982.

Larkin Tyler Wadsworth III (Raleigh, NC), North Carolina State University, B.S., 1982.

Virginia Ellen Wagner (Philadelphia, PA), Drew University, B.A., 1976.

Stephen Nelson Wall (Chapel Hill, NC), University of North Carolina at Chapel Hill, M.S.W., 1981.

Calvin Glenn Warren, Jr. (Selma, NC), North Carolina State University, 1982.

Oscar Jet Webb (Rocky Mount, NC), East Carolina University, M.A., 1979.

Matthew Louis Whitted (Castle Hayne, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Charles Murray Wilkins (Goldsboro, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Carol Ann Williams (Rowland, NC), University of North Carolina at Chapel Hill, B.A., 1977.

Jonathan Deleon Williams (Gastonia, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Steven Bruce Williams (Santa Cruz, CA), University of California at Santa Cruz, B.A., 1981.

Cathy Jo Wilson (Salisbury, MD), University of North Carolina at Chapel Hill.

Locke Wilson (Burnsville, NC), University of North Carolina at Chapel Hill, B.A., 1982.

Jack Haywood Wolf (Binghamton, NY), State University of New York at Binghamton, B.A., 1982.

James Cornelius Womble (Fayetteville, NC), University of North Carolina at Chapel Hill, B.S., 1982.

Jon Pointon Woods (Greensboro, NC), Vanderbilt University, B.A., 1982.

Wilma Jean Wooten (Chapel Hill, NC), University of North Carolina at Chapel Hill, M.P.H., 1981.

Nicholas Saleh Zarzar (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1981.

## THIRD YEAR CLASS

*Co-Presidents: William Harry Billica and Douglas Scott Diekema*

Elizabeth Cobey Allen (Charlotte, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Herbert Richard Allen, Jr. (Sumter, SC), Clemson University, B.S., 1978.

Beverly Lynn Alston (Siler City, NC), Wake Forest University, B.A., 1981.

Sebastian Roosevelt Alston (Henderson, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Jay Arthur Anderson (Durham, NC), University of Minnesota, B.S., 1973; D.D.S., 1973.

Sheila Marbeth Anderson (Chapel Hill, NC), Michigan State University, B.A., 1971; Pembroke State University, B.S., 1980.

Judith Field Aronson (Bethesda, MD), Yale University, B.S., 1980.

Sherrill Leonard Auman, Jr. (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Garry Edward Bayliss (Charlotte, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Patti Beard Beaver (Hickory, NC), University of North Carolina at Greensboro, B.S., 1981.

Calvin Arthur Bell (Greensboro, NC), University of North Carolina at Chapel Hill, B.S., 1980.

William Harry Billica (Greenville, NC), University of North Carolina at Chapel Hill, B.A., 1979.

Clyde Long Brooks, Jr. (Dunn, NC), North Carolina State University, B.S., 1981.

Henry David Bruton II (Southern Pines, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Andrew Gray Bullard (Laurinburg, NC), Davidson College, B.S., 1981.

Leslie Anne Bunce (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Harriet Bursztyn (Brooklyn, NY), Brooklyn College, B.A., 1966; Columbia University, M.S., 1975.

Jay Clarence Butler (Greensboro, NC), North Carolina State University, B.S., 1981.

Mary Louise Canning (Cary, NC), East Carolina University, B.S., 1981.

Charles Leslie Carter (Durham, NC), Southwestern at Memphis, B.S., 1979.

Ginny Cash Charnock (Durham, NC), University of North Carolina at Chapel Hill, B.S., 1981.

George Thomas Clark III (Wilmington, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Kathleen Maria Clarke-Pearson (Forest Hill, NY), Newton College, B.A., 1970.

Lucile Dennison Clotfelter (Durham, NC), University of Georgia, B. Mus., 1969; M.F.A., 1971.

Betty Ann Cohen (Charlotte, NC), University of North Carolina at Chapel Hill, B.S., 1978.

Jonathan Stuart Cohen (Chapel Hill, NC), Dartmouth College, A.B., 1981.

Milton Howard Conley (Hendersonville, NC), University of North Carolina at Asheville, B.A., 1980.

Susan Louise Cookson (Chapel Hill, NC), Duke University, B.S., 1975.

Murray Baxter Craven III (Charlotte, NC), Davidson, B.S., 1981.

Laura Lomax Crow (Greensboro, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Samuel Mac Cummings (Maxton, NC), Eastern Washington University, B.A., 1978.

Rhonda Hardee Davis (Manteo, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Kati Elizabeth Dessauer (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1978.

Douglas Scott Diekema (Grand Rapids, MI), Calvin College, B.S., 1981.

Samuel Victor Duh (Durham, NC), Duke University, B.S., 1977; North Carolina Central University, M.S., 1979.

Cynthia Byrd Dunham (Burlington, NC), University of North Carolina at Chapel Hill, B.S., 1977; M.S., 1979.

Joanne Martha Dykas (New Bedford, MA), Harvard-Radcliffe College, A.B., 1980.

Bernard Thomas Eaton (Winston-Salem, NC), Winston-Salem State University, B.A., B.S., 1981.

Donald Ausbon Edmondson (Tarboro, NC), Wake Forest University, B.A., 1981.

Elizabeth Jane Engelhardt (Bethesda, MD), University of Michigan, B.S., 1979.

Elizabeth Farnum Ennis (Raleigh, NC), North Carolina State University, B.S., 1981.

Bennie Lea Eure (Swansboro, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Samuel Haynie Feaster (Brevard, NC), North Carolina State University, B.S., 1977; M.S., 1981.

Douglas Shure Feltman (Coral Gables, FL), Duke University, B.A., 1976.

Kenneth Edwin Ferrel, Jr. (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Hilari Lanice Fleming (Berkeley, CA), University of California at Davis, B.S., 1977.

Catherine Gordon Fuller (Hickory, NC), Salem College, B.S., 1980.

Charles Harwood Funderburk, Jr. (Matthews, NC), University of North Carolina at Chapel Hill, B.A., 1980 (leave of absence, 1983–1984).

Joseph Andrew Furst (Raleigh, NC), North Carolina State University, B.S., 1980.

Beverly Ann Garrison (Statesville, NC), East Carolina University, B.S., 1977.

Herbert Gaston Garrison III (Davidson, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Janice Marie Garvey (Chapel Hill, NC), Cornell University, A.B., 1979.

Mark David Gershman (Milton, MA), McGill University, B.Sc., 1978.

Mitchell Earl Gibson (Ellerbe, NC), Florida A&M University.

Valda Oray Gibson (Fayetteville, NC), Howard University, B.S., 1981.

Sheryl Ann Gillikin (Aurora, NC), Wake Forest University, B.A., 1981.

John Horace Gilmore, Jr. (Rocky Mount, NC), University of Virginia, B.A., 1981.

Pamela Prudence Golden (New York, NY), Harvard University, A.B., 1980.

Pamella Ann Gregg (Jamestown, NC), Davidson College, B.S., 1981.

Werner Scott Haddon (Cary, NC), North Carolina State University, B.S., 1981.

Susan Caryl Hadler (Chapel Hill, NC), University of George Washington, B.S., 1974; University of North Carolina at Chapel Hill, M.S., 1980.

James Irvine Hagadorn (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Cynthia Anne Hall (Conover, NC), Duke University, B.A., 1979.

James Joseph Hardy (LaGrange, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Charles Augustus Harper, Jr., (Durham, NC), North Carolina Agricultural and Technical State University, B.S., 1973; Tuskegee Institute, D.V.M., 1977.

Kristopher Nels Hartwig (Durham, NC), St. Olaf College, B.A., 1981.

Charles Sigman Hayek (Greenville, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Michael Andrew Hertzberg (Durham, NC), University of California at San Diego, B.A., 1978.

Rona Elsberth Hodge (Durham, NC), University of Virginia, B.S., 1973.

Joseph Patrick Hogan, Jr., (Manassas, VA), University of Virginia, B.A., 1976.

Gary Martin Horowitz (Fayetteville, NC), United States Air Force Academy, B.S., 1974.

Keith Marshall Horton (Greensboro, NC), Duke University, B.A., 1981.

John Christian Huffman (Burlington, NC), Wake Forest University, B.S., 1979.

Susan Diane Hunt (Raleigh, NC), Duke University, B.S., 1973; University of North Carolina at Chapel Hill, M.P.H., 1981.

Joel Walter Hylton, Jr. (Edenton, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Timothy Charles Isley (Snow Camp, NC), University of North Carolina at Chapel Hill, B.A., 1981.

David vanZandt Janeway (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Brentley Doyle Jeffries (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Margaret Gould Johnson (Charlotte, NC), University of North Carolina at Chapel Hill, B.S., 1976.

Warren Lee Jones (Charlotte, NC), North Carolina State University, B.S., 1980.

Peter Manning Jordan (Fayetteville, NC), Davidson College, B.S., 1981.

Stuart Harrington Jordan (Fayetteville, NC), Davidson College, B.S., 1980.

David Coker Joslin (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Michael Milford Judge (Rocky Mount, NC), East Carolina University, B.S., 1981.

Margaret Ann Karis (Durham, NC), Davidson College, B.S., 1981.

Deborah Lynn Kasman (Niles, IL), Brown University, B.A., 1980.

Eric Richard Kenny (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Theodore Charles Kerner, Jr. (Kernersville, NC), University of North Carolina at Chapel Hill, B.S., 1981.

John Alvin Kirkland, Jr. (Goldsboro, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Margaret Ann Kiser (Durham, NC), University of London, BSc., 1969; Ph.D., 1973.

Mark Henry Knelson (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Terance Lamonte Lamb (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Joyce Kathleen Lammert (Chapel Hill, NC), University of Washington, B.S., 1973; Creighton University, M.S., 1977; University of North Carolina at Chapel Hill, Ph.D., 1981.

Frederick Warren Lawler, Jr. (Chapel Hill, NC), Duke University, B.A., 1977.

James Weil Lederer, Jr. (Brown Summit, NC), University of North Carolina at Greensboro, B.A., 1980.

Heidi Ann Leverenz (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1979.

Frank Andrew Luzzi (Durham, NC), Duke University, A.B., 1979.

Vanna Maria Manigault (Charlotte, NC), University of Notre Dame, B.S., 1981.

James Elbert Manning (Williamston, NC), University of North Carolina at Chapel Hill, B.A., 1981.

John David McAllister, Jr. (Raeford, NC), Appalachian State University, B.S., 1970.

Edward Burt McKenzie, Jr. (Salisbury, NC), North Carolina State University, B.S., 1974.

Gwenn Elizabeth McLaughlin (Chapel Hill, NC), Swarthmore College, B.A., 1981.

Keith Eric McManus (Mount Holly, NC), University of North Carolina at Charlotte, B.A., 1978.

Mary Ellen Meighan (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Walter Davis Merritt III (Wichita, KS), University of Kansas, B.A., 1981.

Samuel Werner Mietling (Lexington, NC), Covenant College, B.A., 1980.

Helen Lewis Miller (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1976.

Nancy Hislop Miller (Charlotte, NC), Stockton State College, B.A., 1974.

Stephen Basil Mitchell (Plattsburgh, NY), SUNY at Stony Brook, B.S., 1981.

Linda Lou Moore (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Wistar Moore III (Wilson, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Terry Allen Morrow (Mooresville, NC), Davidson College, B.S., 1981.

Terrence Dewitt Morton, Jr. (Mooresville, NC), University of North Carolina at Chapel Hill, B.S., 1981.

Albert Rogers Munn (Matthews, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Robert Fulton Murray III (Washington, D.C.), University of Michigan, B.S., 1981.

Robert Vance Nichols (Greensboro, NC), Duke University, B.A., 1981.

Albert James Osbahr III (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Leslie Kay Paulus (Winston-Salem, NC), Arizona State University, B.S., 1978.

David Paydarfar (Chapel Hill, NC), Duke University, B.S., 1980.

Frederick Bowen Payne, Jr. (Huntersville, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Majorie Pearsall (Wallace, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Bert Cody Piggott, Jr. (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

William Armistead Price (Chapel Hill, NC), Harvard University, A.B., 1978.

Janice Lee Rea (Matthews, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Joan Fredricka Reback (Matthews, NC), St. Andrews College, B.S., 1979.

William Alexander Reid (Marshville, NC), North Carolina State University, B.S., 1981.

Charles Michael Richardson (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1974; M.A., 1981.

Ted Hugh Robinson (Raleigh, NC), North Carolina State University, B.S., 1979.

Michael Linn Russell (Cary, NC), North Carolina State University, B.S., 1980.

Charles Louis Saltzman (Providence, RI), Brown University, B.A., 1978.

Edward Garner Sanders (Smithfield, NC), University of North Carolina at Chapel Hill, B.A., 1981.

William Eugene Sanders, Jr. (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Eric Stuart Scharling (Boone, NC), Davidson College, A.B., 1975.

Joel Evan Schneider (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Barbara Latowsky Sheline (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1979 (leave of absence, 1983–1984).

Martin Engwall Sheline (Tallahassee, FL), Haverford College, B.S., 1981.

Gregory Wayne Shipp (Durham, NC), Northwestern University, B.A., 1979.

Helen Elizabeth Smith (Mooresville, NC), East Carolina University, B.S., 1981.

McCrae Sidney Smith (Pilot Mountain, NC), University of North Carolina at Chapel Hill, B.S., 1979.

Michael Anthony Smith (Selma, NC), Duke University, B.A., 1981.

Michael Quintel Smith (Wilmington, NC), University of Evansville, B.S., 1977; University of North Carolina at Chapel Hill, M.P.H., 1980.

Grady King Snyder, Jr. (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1978.

Otis Donnell Speight (Kinston, NC), University of North Carolina at Chapel Hill, B.A., 1978.

George Vincent Stephens, Jr. (Durham, NC), University of North Carolina at Chapel Hill, B.A., 1971.

Samuel Patrick Stuart, Jr. (Winston-Salem, NC), Davidson College, B.S., 1981.

Carla Ann Sueta (Winston-Salem, NC), Boston College, B.S., 1975.

Herman Chavis Sullivan (Wilson, NC), Harvard University, B.A., 1981.

Timothy Keen Takaro (Asheville, NC), Yale University, B.S., 1980.

Richard Heard Tardell (Advance, NC), University of North Carolina at Greensboro, B.A., 1976; North Carolina State University, M.L.S., 1979.

Claudia Louise Thomas (Ann Arbor, MI), University of Michigan, B.S., 1981.

Dorothy Elliott Thomas (Elizabeth City, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Thomas Anthony Vassiliades, Jr. (Raleigh, NC), Duke University, B.A., 1979.

Yolanda Kornegay Vaughan (Greensboro, NC), University of North Carolina at Chapel Hill, B.S., 1979.

David Hadley Viskochil (Durham, NC), University of Arizona, B.S., 1977.

James Adams Wainer (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Bradley Kent Weisner (Roanoke Rapids, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Michael Geary White (Hendersonville, NC), North Carolina State University, B.A., 1974; B.S., B.A., 1975.

Randall Watts Williams (Burlington, NC), University of North Carolina at Chapel Hill, B.A., 1979.

Kerry Allen Willis (Davis, NC), North Carolina State University, B.S., 1981.

John Thomas Wilson, Jr. (Whiteville, NC), University of North Carolina at Chapel Hill, B.A., 1981.

Ely David Zaslow (Waltham, MA), Brandeis University, A.B., 1981.

Michael Lawrence Zollicoffer (Baltimore, MD), University of Maryland, B.A., 1980.

Robert Samuel Zucker (Highland Park, IL), Princeton University, A.B., 1979.

Sherrie Elizabeth Zweig (Franklin Square, NY), Cornell University, B.S., 1979.

## FOURTH YEAR CLASS

*Co-Presidents: Steven Joshua Citron and Cathy Ann Wall*

James Porter Alexander, Jr. (Charlotte, NC), Davidson College, A.B., 1979; University of Pennsylvania, A.M., 1980.

Mett Bagley Ausley (Warsaw, NC), Wake Forest University, B.S., 1980.

Andrea Denise Avery (Raleigh, NC), Oakland College.

Robert Gwathmey Badgett (Winston-Salem, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Walter Burns Beaver, Jr. (Charlotte, NC), North Carolina State University, B.S., 1977; M.S., 1980.

Don Antonio Bell (Greensboro, NC), University of North Carolina at Greensboro, B.S., 1980.

James Andrew Bell III (Goldsboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

James Eustace Bizzell II (Raleigh, NC), North Carolina State University.

Lynn Black (Chapel Hill, NC), University of Vermont, B.S., 1974; University of North Carolina at Chapel Hill, M.P.H., 1978.

Paul Bolin, Jr. (Beulaville, NC), East Carolina University, B.S., 1978.

George Washington Brown IV (Dunwoody, GA), Davidson College, B.S., 1980.

Kenneth David Burgess (Taylorsville, NC), Appalachian State University, B.S., 1979.

Anthony Glenn Carraway (Kinston, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Ellen Elizabeth Casper (Cary, NC), Campbell University, B.S., 1979.

Philip Branch Chappell (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1969; Harvard University, M.A., 1970.

John Christopher Cheek (Charlotte, NC), Duke University, B.S., 1979.

Ashok Chopra (Greensboro, NC), Duke University.

Steven Joshua Citron (Matthews, NC), University of North Carolina at Chapel Hill, B.A., 1979.

Harold Fletcher Cottman III (Philadelphia, PA), Harvard University, B.A., 1973.

Mark Harned Davis (Winston-Salem, NC), San Jose State University, B.A., 1975.

Whitney Kent Davis (Charlotte, NC), Duke University, B.S., 1980.

Alain Thomas Drooz (Cary, NC), Massachusetts Institute of Technology, B.S., 1980.

Kevin Owen Easley (Rocky Mount, NC), University of North Carolina at Chapel Hill, B.S., 1975; North Carolina Central University, J.D., 1978.

Samuel Curtis Elliott III (Troutman, NC), Davidson College, B.A., 1980.

Charles Lee Ewell, Jr. (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1977.

Barbara Blake Fawcett (Wrightsville Beach, NC), Duke University, B.S., 1979.

Patricia Ann Ferrari (Chapel Hill, NC), LeMoyne College, B.S., 1973; University of North Carolina at Chapel Hill, Ph.D., 1980.

Eli David Finkelstein (Durham, NC), University of Maryland, B.S., 1976; Duke University, Ph.D.

Sarah Amelia Fort (Albemarle, NC), Guilford College, B.S., 1979.

Kathleen Jane Foster-Wendel (Chapel Hill, NC), University of Michigan, B.S., 1977.

James Lawrence Freddo (Greenville, NC), State University of New York, B.S., 1977.

Ray Michael Freeman (High Point, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Michael Evan Garfinkel (Greensboro, NC), Davidson College, B.S., 1980.

Thomas Tracy Giduz (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1979.

Stephen Eric Gitelman (Durham, NC), Princeton University, A.B., 1980.

Stephen Edward Godar (Raleigh, NC), Davidson College, B.S., 1977.

Anthony Neal Gregory (Buies Creek, NC), Davidson College, B.A., 1974.

Margaret Lynn Gulley (Chapel Hill, NC), Duke University, B.S.E., 1980.

Amos Earl Haddock (Wilmington, NC), University of North Carolina at Wilmington, B.S., 1976; Duke University, B.H.S., 1978.

Ronald Paul Hargrove (Roanoke Rapids, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Helen Easter Harmon (Fayetteville, NC), University of North Carolina at Chapel Hill, B.S., 1980.

James Robinson Harper, Jr. (Durham, NC), Vanderbilt University, B.A., 1980.

Stephen Davis Harris (Durham, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Maurice Earl Heard III (Highland, NC), Dartmouth University, B.A., 1974.

Keith Douglas Herzog (Princeton, NJ), Duke University, B.S., 1979.

James Carver Hill (Hendersonville, NC), Clemson University, B.S.E.E., 1961; Oregon State University, M.S., 1964; Ph.D., 1969.

Catherine Carroll Hobbs (Raleigh, NC), North Carolina State University, B.S., 1980.

Elgin Hobbs, Jr. (Fayetteville, NC), University of North Carolina at Chapel Hill, B.A., 1979.

Roger Alan Hodge (Lenoir, NC), Davidson College, B.S., 1980.

Besma Kamal Ibrahim (Raleigh, NC), North Carolina State University.

Stephen Brian Irvin (Cary, NC), University of North Carolina at Chapel Hill, B.A., 1980.

William David Isenhower, Jr. (Newton, NC), Davidson College, B.S., 1980.

Paul Garrett Israel (Durham, NC), Duke University, B.S., 1979.

Linda Ellen Jaffe (Charlotte, NC), State University of New York, B.A., 1977.

Paul Arthur James (Tarboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Lydia Ann Johnson (Durham, NC), University of North Carolina at Chapel Hill, B.A., 1977.

Susan Jane Joyner (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Michael Joseph Knight (Charlotte, NC), University of North Carolina at Chapel Hill, B.A., 1977.

Marcia Anne Koomen (Raleigh, NC), North Carolina State University.

Sarah Smith Kratz (Raleigh, NC), University of Michigan, A.B., 1977.

Cary Jake Lambert, Jr. (Smithfield, NC), University of Notre Dame, B.S., 1980.

Mary Lou Lawson (Charlotte, NC), North Carolina State University, B.S., 1978.

Rita Torres Layson (Greensboro, NC), Bucknell University, B.S., 1970; University of Chicago, M.A., 1976.

Thomas Warren Lee (Fairview, NC), Western Carolina University, B.S.H.S., 1979.

Joel David Lilly (Houston, TX), Rice University, B.A., 1980.

John Walter Lindsay (Greensboro, NC), North Carolina A&T State University.

Robert Propst Lineberger (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Ferriss Yarnell Locklear (Maxton, NC), Pembroke State University, B.S., 1980.

Gregory Locklear (Maxton, NC), Pembroke State University, B.S., 1979.

James Joseph Logan (Durham, NC), Clark University, B.A., 1975.

Gerald Craig Lynch (Roanoke Rapids, NC), University of North Carolina at Chapel Hill, B.S., 1980.

John Leach MacNeill, Jr. (Washington, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Dugan Wiess Maddux (DeFuniak Springs, FL), Vanderbilt University, B.A., 1980.

John Chetwood Mahler, Jr. (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Jo Smith Matheny (Jacksonville, NC), Indiana University, B.S., 1976.

Brenda Celeste McClain (Wilson, NC), University of North Carolina at Chapel Hill, B.S., 1977.

Robert Wilson McMurray (Huntersville, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Russell Glen Medders (Louisburg, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Tommy Lampros Megremis (Greensboro, NC), University of North Carolina at Charlotte, M.S., 1980.

Jesse David Mitchell (Council, NC), Oakwood College.

Joel Blane Moffett (Burlington, NC), University of North Carolina at Chapel Hill, B.S., 1979.

Jane Hospodar Murray (Chapel Hill, NC), Miami University at Oxford, Ohio, B.S., 1975.

Howard Wilson Newell, Jr. (Mineral Springs, NC), East Carolina University, B.S., 1980.

Christopher Cheukho Ng (Robersonville, NC), Wake Forest University.

Dale Ellen Nichols (Durham, NC), James Madison University, B.S., 1978.

Keith Cameron Nichols (Kill Devil Hills, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Richard Claiborne Noble (Kinston, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Gregory Scott Pape (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Gregory Dean Parker (Cullowhee, NC), Duke University, B.S., 1980.

Joseph Minter Payne, Jr. (Clayton, NC), North Carolina State University, B.S., 1980.

Douglas Warren Peed (Jacksonville, NC), North Carolina State University, B.S., 1980.

Mark Edward Peele (Colerain, NC), East Carolina University, B.S., 1980.

Kathryn Griesedieck Powell (Wake Forest, NC), East Carolina University, B.S., 1976.

Thomas Michael Price (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Ronald Edward Pruitt, (Oxford, NC), University of North Carolina at Chapel Hill, B.A., 1976.

Milton Barry Randall (Cliffside, NC), University of North Carolina at Chapel Hill, B.A., 1980.

David Jeffrey Rawlings (Hockessin, DE), Davidson College, B.S., 1979.

Annamarie Reddin (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Thomas Eugene Register, Jr. (Burlington, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Tae Hyon Rho (Durham, NC), Duke University, B.A., 1980.

Alfred Leonard Rhyne III (Winston-Salem, NC), Davidson College, B.S., 1980.

Janice Lynn Roberts (Youngsville, NC), North Carolina State University, B.S., 1980.

Gregory Wayne Ross (Shelby, NC), North Carolina Central University, B.S., 1978.

Richard Gibran Saleeby, Jr. (Raleigh, NC), North Carolina State University, B.S., 1978; M.L.S., 1980.

Robert Ardel Sammons, Jr. (Greenville, NC), Auburn University, B.A., 1967; M.S., 1969; University of Tennessee, Ph.D., 1974.

William Earl Sanderson (Fairmont, NC), Pembroke State University, B.A., 1979.

David Luther Sappenfield (Fayetteville, NC), Davidson College, B.S., 1980.

Martha Marion Sarasua (Durham, NC), University of West Florida, B.S., 1975; University of North Carolina at Chapel Hill, Ph.D., 1980.

Paul William Sasser (Rocky Mount, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Mary Alison Saunders (Chapel Hill, NC), University of North Carolina at Chapel Hill, B.S., 1978.

John Martz Schoffstall (Greensboro, NC), University of North Carolina at Greensboro, B.A., 1974.

Greta Renee Setzer (Bessemer City, NC), Gardener-Webb College, B.S., 1980.

Jonathan Lee Sheline (Tallahassee, FL), Brown University.

Monica Harris Shelton (Kinston, NC), North Carolina State University, B.S., 1978.

Thomas Earl Shook (Asheville, NC), University of North Carolina at Chapel Hill, B.A., 1977; M.P.H., 1980.

Eddie Louis Smith (Greenville, NC), University of North Carolina at Chapel Hill, B.S., 1979.

Rebecca Ruth Sheline Socolar (Tallahassee, FL), Bryn Mawr College, B.A., 1979.

David Evan Sorenson (Hendersonville, NC), Tufts University.

John Thomas Southern (Rowland, NC), North Carolina Central University, B.S., 1979.

Thomas Clayton Spangler (Greensboro, NC), Davidson College, B.S., 1980.

Sharon Rose Stephenson (Benson, NC), Meredith College, B.S., 1977; Indiana University, M.S., 1980.

Michael Cooper Stevens (Morganton, NC), Washington and Lee University, B.A., 1969.

Julia Sink Streets (Lexington, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Richard Clark Stuntz, Jr. (Lenoir, NC), University of North Carolina at Charlotte, B.S., 1977.

Denny Cook Tate (Burlington, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Jean Gregory Taylor (Durham, NC), Furman University, B.S., 1966.

Gregory Tyrone Teel (Greenville, NC), Winston-Salem State University, B.S., 1978.

Neal Thornton Thompson (Selma, NC), North Carolina State University, B.S., 1980.

Howard Stanley Tuch (Chapel Hill, NC), University of Connecticut, B.A., 1975; M.A., 1978.

James Kimbal Vincent (Snow Hill, NC), University of Missouri-Columbia, B.A., 1973.

Paul Edward Viser (Ahoskie, NC), University of North Carolina at Chapel Hill, B.S., 1980.

Robert Alan Wainer (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Cathy Ann Wall (Rockingham, NC), Wake Forest University, B.A., 1980.

Rolf Bolin Wallin (Whispering Pines, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Mark Lowe Warren (Raleigh, NC), Wake Forest University, B.A., 1980.

Alan Barry Weiner (Durham, NC), Duke University, A.B., 1972.

Armistead Landon Wellford IV (Raleigh, NC), Virginia Military Institute, B.S., 1980.

Elizabeth Alliaude White (Greenville, NC), Davidson College, B.S., 1980.

Robert Earl Wiggins, Jr. (Greensboro, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Daniel Walter Williams III (Charleston, WV), West Virginia University, A.B., 1978.

John Taylor Williams (Boone, NC), Appalachian State University, B.A., 1976; University of Tennessee, M.S., 1980.

John Wiley Williams, Jr. (Carthage, NC), University of North Carolina at Chapel Hill, B.A., 1980.

Phyllis McGee Woodring (Concord, NC), University of North Carolina at Chapel Hill, B.S., 1978.

Joan Edwin Wynn (Pollocksville, NC), Spelman College, B.S., 1978.

Michael Nakhleh Zarzar (Raleigh, NC), University of North Carolina at Chapel Hill, B.A., 1980.

# *Index of Faculty**

**Bold face type indicates primary department*


Ackerman, Jayne, A., 156
Adams, Harvey, 167
Adams, Kirkwood F., Jr., 154
Addison, Randolph, 182
Adelman, James U., 164
Albergotti, Julian S., 136
Alexander, James Frost, 153
Alexander, J.M., 152
Alexander, Lawrence M., 136
Allen, Cyril A., 156
Allen, Fred H., Jr., 152
Allen, James W., 221
Allen, Wain, 136
Allen, William Giles, 154
Allgood, J.W., 154
Aluise, John J., 135
Alumkuist, Ralph D., II, 153
Alva, Juan, 154
Amick, Arthur F., 154
Anatasio, Geraldine, 138
Anderson, Alton, R., 136
Anderson, Nadia M., 171, 5
Andracchio, Vincent C., 123
Andresen, Jeffry L., 192, 72
Andrews, Michael J., Jr., 156, 204
Ansari, Aftab A., 153
Archer, Willis A., 178
Arendshorst, William J., 188
Arnold, Larry W., 159
Arrington, John H., III, 133
Ashburn, Philip Eugene, 154
Ashford, Charles H., Jr., 203
Askin, Frederic B., 170, 5
Attermeier, Susan M., 144
Atwater, John S., Jr., 178
Auman, George L., 178
Austin, Walter Kenneth, Jr., 156
Axelbank, Arthur, 136
Aylsworth, Arthur S., 176

Bachenheimer, Steven L., 159, 210
Badawi, Raouf F., 194
Badger, Don W., 180
Bagnell, Charles Robert, 172
Bailey, Bruce O., 136
Bair, Donald Glen, 167
Baird, Haynes W., 172
Baker, John Harrison, 166
Baker, John W., 153
Baker, Richard M., 134
Bakewell, William, E., Jr., 192, 7, 10, 72
Ball, Brenda Combs, 195
Banes, Albert J., 202
Bardeles, Jose A., Jr., 178
Barefoot, Sherwood W., 132
Barker, Julian, 166
Barkley, Karl L., 166
Barnett, Thomas B., 149
Barrett, James C., 172, 211
Barry, D.R., 200
Barry, E.G., 210
Barry, Paul D., 197
Bashford, Robert A., 166
Bassford, Philip J., Jr., 159, 211
Batson, Ronald M., 195
Battaglini, James W., 202
Battigelli, Mario C., 149, 220
Baucom, Mary Padgett, 154
Baumrucker, John F., 135
Bean, Gary O., 137
Beauchamp, Dan E., 199
Bechtoldt, Albert A., Jr., 122
Beck, Paul, 149, 231
Beck, Susan J., 141
Becker, Denis I., 154
Becker, Susanne E., 166
Beckman, William C., Jr., 202
Beed, Elaine Alfreda, 156
Bell, Fred E., 125
Bell, Robert M.S., 136
Bellamy, William Edward, Jr., 153
Bellinger, Dwight A., 171, 230
Bend, John Richard, 221
Benedum, John L., 154
Bennett, William T., 153
Bentley, Stuart A., 171
Berkowitz, Lee R., 151
Bernard, Stephen A., 154, 71
Bernstein, James D., 200
Bernstein, Jerry C., 178
Berolzheimer, Nathan, 136
Berry, Joseph A., 136
Berry, William Rosser, 154
Betts, Charles S., 154
Bevin, Abner G., Jr., 201
Bhatt, Dushyant N., 156
Bianchi, Raymond Francis, 154
Bierma, John R., 139
Biggers, William Paul, 201
Bilbro, Robert H., 135, 153
Birnbaum, L.S., 221
Black, James Hampton, 153
Blair, George Walker, Jr., 153
Blake, Gerald Wayne, 153
Blakeney, Anne B., 143
Blaurock, A.E., 117, 77
Bloom, K.S., 211
Bloomfield, Richard A., 137
Blum, M.R., 221
Blythe, William B., 149
Boat, Barbara W., 193
Boat, Thomas F., 176, 9, 17
Bobzien, William Fred, 153
Boehlecke, Brian A., 150, 227
Boehm, O. Robert, 158
Boer, Henry R., 178
Boerner, David Franklin, 156
Boerner, Robert M. 152, 135
Bogdewic, Stephen P., 135
Boice, John A., 154
Bondurant, Stuart, 149, 3-4, 7, 8, 9, 14, 15, 17, 59
Bondy, Stephen C., 182, 215

Bonner, M.D., 152
Boone, Stephen Christopher, 202
Boorman, Gary A., 172
Bose, Carl L., 177
Boswell, John I., Jr., 192
Bott, Kenneth F., 158, 210
Boucher, Richard, C., Jr., 150
Bouldin, Thomas W., 171
Bowdre, Jean H., 159, 171
Bowes, Watson A., 165, 5
Box, Emily J.H., 154
Box, Patrick, 154
Bozymski, Eugene M., 149
Brackbill, Thomas A., 153
Bradford, Edward A., 154
Brame, Robert G., 165
Branning, Stephen A., 156
Brashear, Harry R., Jr., 201
Bream, Charles A., 196
Breese, George R., 192, 181, 214, 224
Brennan, Michael West, 168
Brenton, Bradley C., 197
Brett, Charles B., 178
Brewer, James C., 136
Brickley, James J., Jr., 205, 163
Bridges, Eugene D., 195
Bright, Don C., 123
Briggaman, Robert A., 132, 73, 149
Bristol, Marie M., 195
Brodie, Bruce R., 153
Bromberg, Phillip A., 149, 10, 227
Brooks, John I., Jr., 153
Brother, George B., Jr., 156
Browder, James P. III, 203
Brown, Albert Belmont, 166
Brown, David W., 154
Brown, Robert Calvin, 172
Brown, Wallace D., 178
Brownlee, Robert C., 177
Bruce, James C., 153
Bruce, William E., 135
Bruton, Henry David, 178
Bryan, Edwin Lancaster, 152
Bryan, James A., II, 149, 5, 68, 134, 199
Bryan, William A., III, 178
Bryan, William B., 178
Buchanan, Jack W., Jr., 152, 205
Buckwalter, Joseph A., 201
Buie, Roderick Mark, Jr., 153
Buley, Bruce, 144
Bullock, William R., 153
Bumgarner, J.R., 154
Burford, Hugh J., 182
Burgess, William Patrick, 156
Burnett, Gordon B., 192
Burnett, John Eric, Jr., 165
Burnham, Steven J., 202, 5
Burns, Charles B., 144, 197
Burns, Walter W., Jr., 203
Burridge, Keith W.T., 118, 68, 125
Burroughs, Frederick D., 178
Burroughs, Paul L., Jr., 203
Bussa, John Joseph, 168
Butts, John D., Jr., 171
Butzin, Diane W., 180
Bynum, Donald K., 202
Cable, Thomas A., 135
Cade, Jerry, 136
Caldwell, Ronald R., 153
Callanan, Nancy P., 180
Callaway, Mary, 194
Calvert, Samuel J., 156
Camp, Thomas Francis, 153
Campbell, Donald B., 154
Campbell, Lorin S., 199
Campbell, Suzann K., 143
Canaday, Bruce R., 153
Cancelosi, Susan Ellen, 159, 69
Cannon, Helen C., 178
Cannon, Janne G., 159, 211
Caplow, Michael, 124
Capowski, Joseph J., 189
Carl, Phillip L., 182, 231
Carmen, Elaine, 192
Carmichael, Dennis D., 178, 194
Carney, Charles N., 171
Carson, Johnny Lee, 180, 227
Carter, Charles W., Jr., 125, 117
Carter, Coleman D., 154
Carter, Robert W., 154
Cassata, Donald M., 134
Casto,Daniel T., 194
Cato, Allen E., 194
Caviness, V.S., 152
Cefalo, Robert C., 165, 7, 10
Cefalu, Salvador J., 194
Cerwin, Robert A., 197
Chae, Chi-Bom, 125
Chamberlin, Harrie R., 176, 224
Chambliss, John Randolph, 152
Chandler, Joe T., 153
Chaney, Edward L., 198, 146
Chaney, Stephen G., 125, 67, 72, 220
Chang, Jerjang, 171, 230
Chang, Meimei, 168
Chapman, John F., Jr., 171
Chapman, Robert S., 179
Charlton, John D., 206, 164
Cheely, George R., 154
Cheng, Pi-Wan, 176, 125
Cheng, Yung-chi 181, 149, 225
Chiramonti, Alexander, 133
Chignell, Colin F., 182, 221
Choski, Janak, 154
Chou, D., 205
Chiaramonti, Alexander, 133
Christian, R. Meade, 179
Churchill, Larry R., 199, 69
Cidlowski, John A., 188, 125
Citron, David Sanford, 152
Clark, Daniel E., 197
Clark, Kenneth J., Jr., 153
Clark, Preston S., 154
Clark, Richard Lee, 196
Clark, Theodore R., 194
Clark, William G., 137
Clarke, John P., 203
Clemmons, David R., 151, 229
Cler, Barbara G., 137
Cline, Robert S., 137
Cloninger, Timothy E., 197
Clyde, Wallace A., Jr., 176, 158

Cocolas, G. H., 220
Codington, John B., 203
Coffee, Archie T., Jr., 153
Coffer, Bertram W., 123
Coffey, James C., Jr., 180
Cogswell, Betty E., 134
Cohen, Kenneth L., 168
Cohen, Myron S., 151, 159
Cohen, Philip L., 150, 195
Cole, Carolyn H., 194
Coleman, Gordon Donald, 179
Coley, Elwood Brogden, 178
Colindres, Romulo E., 149
Collier, Albert M., 176, 227
Collins, Myra L., 171
Comer, Wilson, S., Jr., 195
Compton, Betty N., 179
Conley, Martin J., Jr., 154
Conley, William Gustavus, III, 178
Conrad, Douglas M., 195
Cook, Harold L. 140
Cooper, A.D., 154
Cooper, Barrett R., 153
Cooper, Herbert A., 171, 176
Cooper, Tim Ervin, Jr., 153
Copeland, Dana Derward, 166
Cordeiro-Stone, Marila C., 172
Corder, Billie F., 195
Corke, Barry C., 122
Cornwall, Thomas P., 195
Coronado, Roberto, 182
Coulter, Norman A., Jr., 201, 187, 214
Council, John C., Jr., 179
Cowan, James C., 200
Cowan, Judith Ryder, 193
Cox, Stanley C., III, 203
Coxe, James S., III, 154
Craft, William H., 180
Craige, Ernest, 149
Craven, Jesse Clarence, 153
Credle, Willian F., Jr., 153
Crews, Harry D., 154
Crist, Takey, 166
Crocker, Daniel L., 154
Cromartie, William J., 158, 149
Cronenberger, Helen, 141, 171
Croom, Robert D., 202
Cross, Alan W., 200, 5, 177
Cross, Robert E., 171, 150, 230
Cuatrecasas, Pedro, 182, 152
Cubeddu, Luigi X., 182, 72, 150, 214
Culbreth, Constance L., 195
Currie, John L., 165
Curtis, Peter, 134
Curtis, Thomas E., 192
Cutchin, Lawrence McG., 200, 135, 154
Cuttino, John T., Jr., 196

Dahlstrom, William Grant, 193
Dahners, Lawrence E., 202
Daley, John G., 165
Dalldorf, Frederic G., 170
Dalston, E., 148
Dalston, Rodger M., 202
Dalto, Carmine, 154
Dameron, Thomas Barker, Jr., 202
Damstra, Terri, 125
Daniel, Walter, 123
Danis, Marion, 151
Dascomb, Harry E., 149
Daugird, Allen, 137
Davenport, John E., 156
Davidian, Edward W., 123
Davidson, Jonathan R.T., 193
Davidson, Richard A., 151
Davis, Ann T., 136
Davis, Clark W., 188
Davis, Dwight G., Jr., 203
Davis, James Evans, 202
Davis, Robert Nicholas, 133
Daw, John Charles, 188
Dawson, Shelton P., 179
Dean, Jack Hugh, 221
Dean, John N., 153
DeAngelis, W. Julio, 135
Dee, Arthur L., 171
Deering, Timothy B., 153
DeFriese, Gordon H., 199, 149
Delany, David J., 196
Demas, Ronald C., 156
Denny, Floyd W., 176
Derbyshire, John S., 156
D'Ercole, Augustine J., 177
de Serres, Frederick J., 172, 210
Detweiler, Donald C., 197
DeWalt, Joseph Leo, 154, 203
Dewar, Sally R., 148
Deyton, Walter E., 197
Diaz-Buxo, Jose A., 153
DiBianca, Frank A., 196, 205
Dickson, Griggs Cameron, 178
Diliberto, Emanuel J., Jr., 183
Dill, Thomas Edward, 137
Dineen, James Robert, 203
Dingledine, Raymond J., Jr., 182, 215
Dirkers, Jerome D., 154
Dolan, Daniel L., 150
Dombrose, Frederick Anthony, 125
Domby, W. Roger, 153
Domnas, Aristotle J., 125
Donahue, Michael J., 133
Donohue, James F., 150
Doolittle, Robert P., 154
Dorfman, Margaret J., 195
Douglas, Benjamin, 204
Dowdy, David A., 154
Doyle, Owen W., 198
Doyle, Raymond T., 154
Drake, John W., 210, 221
Drake, W. Rodwell, Jr., 136
Dreyer, Duane A., 188
Drobnes, William E., 197
Droegemueller, William, 165, 9, 17
Drossman, Douglas A., 150
Dudley, Kenneth H., 181, 220
Dunlap, William M., 153
Dunphy, Donal, 176, 21
Durante, Spencer E., Jr., 156
Durfee, Michael F., 177
Durham, Cecil T., Jr., 164, 136
Durham, William F., 221

Dykstra-Hylander, Linda A., 182, 214
Dykers, John, 136
Eakins, Joey W., 153
Earley, Charles M., Jr., 203
Earp, Henry S., III, 150, 71, 225
Easterling, William E., Jr., 165, 7, 10, 17
Eaton, Hubert A., Jr., 154
Edelman, David A., 166
Edelsohn, Gail A., 195
Edgell, Cora-Jean S., 172, 211
Edgell, Marshall H., 158, 210, 231
Edgerton, J. Wilbert, 192
Edwards, George Sadler, 203
Edwards, Jesse J., 172
Ehle, Albert L., 163, 150
Eifrig, David E., 168, 8, 9, 17
Eisenberg, Robert A., 150, 228
Eldridge, Frederic L., 150, 187, 214
Eling, Thomas Edward, 221
Elion, Gertrude B., 182
Elliott, Charles M., 154
Ellis, F.W., 181, 214
Elliston, Lewis Daniel, Jr., 154
Ellithrope, Charles, 136
Elmore, Miles, 153
Elwell, Lynn Paul, 159
Emmett, John R., 203
Ennis, E.G., 139
Errede, B.S., 211
Estacio, Luz M., 123
Estroff, Sue Ellen, 200
Eure, Charles A., 153
Evans, Dwight L., 193, 151
Evans, Wallace N., 136
Ewing, John A., 192, 10, 72, 227

Faber, James E., 188
Fajgenbaum, David M., 204
Falk, R., 177
Falk, Ronald J., 151
Farel Paul B., 188, 69, 214
Farmer, Charles Dudley, 152
Farmer, John L., Jr., 133
Farmer, Thomas W., 163, 150
Faust, Robert G., 187
Fehrenbaker, Lawrence G., 203
Fenning, Robert L., 152
Ferdon, Benjamin B., 153
Ferguson, Josephus D., Jr., 203
Ferguson, J.H., 187
Ferguson Wayne, S., 203
Fernald, Gerald W., 176
Fernandez, Charles R., 153
Fesperman, Joseph C., 137
Ficklen, Conway H., 166
Fidler, Donald C., 193, 72
Finn, Arthur L., 150, 187
Finn, William F., 150
Fiorilli, Mario Grazia, 154
Fischer, Gary J., 197
Fischer, Janet J., 150, 5, 159
Fischer, Joal, 179
Fischer, Newton D., 201
Fisher, Ada M., 137
Fisher, Otis N., 198
Fisher, Ronald, 137
Fisscher, Rolf H., 193
Flaherty, James F., 137
Flanagan, Tony Emerson, 166
Flash, William S., 193
Fleming, Paul Arthur, 137
Fleming, Michael F., 135
Fleming, W.L., 150, 134
Fletcher, Robert, H., 150, 232
Fletcher, Suzanne W., 150
Folds, James D., 158, 170, 230
Follmer, Ronald L., 153
Follo, Paige, 178
Ford, E.L., 178
Fordham, Christopher C., III, 7, 150, 199
Foreman, Robert H., 137
Forman, Donald T., 170, 124
Fort, W. Davis, 166
Foster, James R., 150
Foster, William Wade, 168
Fouts, James R., 182, 221
Fowler, Bruce Andrew, 172, 221
Fowler, Mary Glenn, 177
Fowler, Wesley C., Jr., 165, 225
Fowlkes, Dana M., 171, 211
Fox, Powell G., Jr., 203
Foy, Jane M., 179
Franco, Juan Carlos, 172
Franklin, Earl R., 179
Fraser, D.A., 220
Fraser, Hugh E., Jr., 133
Frazier, Arnold R., 152
Frazier, Harold L., 194
Frazier, Patricia Dianne,126
Freedman, S. Mitchell, 164
Freeman, David F., 193
Freeman, Douglas G., Jr., 154
Frelinger, Jeffrey A., 158, 210, 225
French, Frank S., 176
Frey, John J., 134
Frick, Donna E., 195
Fried, Floyd A., 201, 5
Fried, Howard M., 125, 211
Fried, Michael D., 166
Friedman, Charles P., 134, 228, 234
Friedman, Mitchell, 150, 220, 227
Frierson, Henry T., 134, 234
Fry, Terry L., 202, 5
Fulghum, Mary Susan K., 166
Fullerton, William Dean, 200

Gabriel, Don A., 150
Gaddy, Robert E., Jr., 153
Gaisie, Godrey, 196
Gaither, Ronald Spencer, 166
Gal, Peter, 137
Galinsky, M. David, 193
Gallagher, M., 214
Galusha, Bryant Leroy, 177
Gammon, Walter Ray, 132, 150
Garber, Ronald L., 153
Garbutt, James C., 193
Gardella, John Eugene, 155
Garfinkel, Daniel, 135
Garrabrant, Edgar C., 203

Garrett, Norman Hesson, Jr., 152
Gatzy, John T., Jr., 181, 220
Gay, Robert M., 172
Gazak, John Michael, 179
Gegick, Charles G., 153
Gellhorn, Alfred, 200, 152
Gennick, Sharon E., 125
Geratz, Joachim D., 170
Gerock, H.W., 136
Gettes, Leonard S., 150,, 189
Ghassemian, Jafar N., 155
Ghia, Jawahar N., 122
Ghosh, Nirmalya K., 156
Gibson, James E., 221
Gilbert, Jerome A., 202
Gilbert, L.I., 214
Gilchrist, Paul A., 138
Gilgor, Robert S., 132
Gillen, Howard W., 164
Gillespie, George Y., III, 202, 172, 214, 230
Gillings, Dennis B., 228
Gilmore, Brooks Webster, 153
Gilmore, Samuel J., 166
Ginn, William M., 153
Gitelman, Hillel J., 150, 73
Glasscock, Michael E., 202
Glasser, Richard L., 188, 214
Glassman, Edward, 124, 210, 214
Glaubiger, George A., 155
Glickman, Barry W., 172, 210
Glover, James B., 166
Godwin, Harold Lacy, 152
Godwin, Herman A., Jr., 152
Golberg, Leon, 182, 172, 221
Golby, Mary B., 155
Gold, A., 220
Golembe, Barry L., 179
Goley, Alexander F., 153
Gonzalez, Jorge J., 151
Gooder, Harry, 158, 5, 70, 210
Goolsby, Elaine, 140
Gordon, B.N., 194
Gottovi, Daniel, 153
Gottschalk, Carl W., 150, 187
Gough, William, III, 153
Goyer, Robert A., 172
Goz, Barry, 182, 72, 220
Grace, Eugene V., 169
Graham, Gloria, 132
Graham, John B., 170, 210
Granger, Noelle A., 118
Granovetter, David A., 155
Grant, George R., Jr., 153
Grant, Hugh Judd, 166
Grant, L.D., 215
Grass, Frank S., 179
Gratta, Albert R., 123
Gray, Mary J., 166, 5
Gray, Timothy K., 150, 181
Green, Edwin Jay, 155
Green, Julius A., Jr., 198
Greenberg, Robert, 177
Greene, Alan H., 155
Greene, Ralph L., Jr., 153
Greene, Walter B., 202, 177
Greenspan, J.D., 188
Greenwood, James B., 136
Greenwood, Roberts S., 163, 151, 214
Greer, Thomas B., 166
Greganti, Mac A., 151
Grier, Michael William, 155
Griffin, Frances M., 152
Griffin, Newton Bramblett, 166
Griffin, Tommy Brewer, 133
Griffith, Frederick H., 200
Griffith, Jack, 159, 125, 210
Griffith, Michael J., 171, 125, 152
Grigg, Claud McNeill, 153
Grigg, Wendell R., Jr., 194
Griggs, Thomas R., 151, 171
Grimson, Baird S., 168
Grisham, Joe W., 170, 9, 17, 150, 220
Gronemeyer, Wiliam H., 177
Grosshandler, Stanley L., 123
Grossman, Steven H., 155
Grove, David D., 155
Gruhn, William B. , 156
Gualtieri, C. Thomas, 193, 72, 224
Guest, Chris W., 156
Guilford, William B., 196
Guiteras, George P., 136
Gulledge, Sidney L., III, 169
Gupta, Gool K., 156
Gupta, Jagmohan D., 155
Gustke, Susan S., 153, 193
Guthrie, Aldine K., 139
Gwynne, John T., 151
Gwyther, Robert E., 135

Haak, Edward D., Jr., 155
Haas, William H., III, 138
Hackenbrock, Charles R., 117, 9
Hadjian, Sophia, 148
Hadler, Nortin M., 151, 159
Haggerty, John J., 193, 136
Haizlip, Thomas M., 194
Hak, Lawrence J., 155
Hale, Leslie Morgan, 168
Hall, Colin D., 163, 150
Hall, Donald G., 153
Hall, Francoise, 195
Hall, I.H., 220
Hall, James B., 166
Hall, John Howland, 133
Hall, Warner L., 166
Halle, Jan S., 197, 73
Halleck, Helen L., 195
Halleck, Seymour L., 192
Halme, Jouko K., 166
Halperin, Alan K., 151
Hamby, George W., 194
Hamilton, James P., 203, 179
Hamilton, Thomas E., 137
Hamit, Harold F., 202
Hammer, Douglas Ira, 123
Hammond, John E. 171, 125, 151
Hammond, Mary G., 166, 73
Hamrick, Harvey J., 177, 134
Hanker, J.S., 214
Hansen, Alfred R., 202, 17
Hansen, Charles J., 156
Harbold, Norris B., 152

Harden, T. Kendall, 182, 214
Hardin, Richard H., 135
Harding, Robert William, 156
Hardison, Cynthia S., 153
Hardison, Joseph H., 155
Hardy, Ira M., II, 203
Hare, Roy Allen, 152
Harned, Herbert S., Jr., 176
Harned, Jean G., 140
Harper, Curtis, 182, 220
Harper, James Robinson, 153
Harper, Larry O., 155
Harris, Bernard B., 195
Harris, C.M., 154
Harris, Charles Walker, 153
Harris, Florence, 194
Harris, Holly F., 148
Harrison, Melody F., 148
Harshaw, Charles W., Jr., 155
Hart, Elzie Franklin, 203
Hart-Brothers, Elaine M., 156
Hartzog, Henry G., III, 203
Haskill, John S., 165, 158
Hassell, Charles Matthews, Jr., 171
Hatcher, Martin A., Jr., 164
Hatley, Linn H., 166
Hatten, H. Paul, Jr., 197
Hauch, Thomas W., 155
Haughton, Geoffrey, 158, 210
Hawes, Stephen James, Jr., 156
Hawkins, Gloria A., 167
Haworth, Chester C., Jr., 164
Hawthorne, Henry C., 179
Hayeck, E.G., 164
Hayes, David Allen, 155
Hayes, Richard I., 166
Hayward, James N., 163, 8, 9, 17, 150, 214
Haywood, Bertram Don, 166
Haywood, Hubert B., III, 155
Hazucha, Milan J., 152, 221, 227
Heaton, Frederick Christian, 166
Hebbert, V.J., 177
Heizer, William D., 150
Helak, Joseph Walter, 155
Heller, Joel H., 137
Hemingway, George C., 155, 136
Henderson, Frederick W., 177, 227
Henderson, Gail E., 200
Henderson, George P., 203
Henderson, Miller L., 156
Henderson, Richard Robert, 133, 136
Hendricks, Charles H., 165
Henke, David, 156
Henley, John T., Jr., 203
Henry, George W., 177
Henry, Marianna M., 177
Henson, Miriam M., 202
Henson, O'Dell W., Jr., 117, 68, 214
Henson, T.A., 178
Herbert, William N., 165
Herbst, Charles A., Jr., 202
Herion, John C., 150
Herman, Brian, 118
Hermans, Jan, 124
Herring, William B., 150
Herrington, Robert T., 177
Hester, David Alan, 156
Heyer, Robert A., 155
Hickey, Docia E., 179
Hicks, Charles M., 178
Hidalgo, Hector J., 197
Hiestand, FitzGerald L., 153
Higginson, John L., 172
Hilger, Anthony E., 141
Hill, Dennis L., 153
Hill, Haywood N., Jr., 153
Hill,W. Wallace, 140
Hinshaw, Howard T., 153
Hirsch, Philip F., 181
Hisley, John C. 165
Hitchings, G.H., 182
Hobson, Jack Brown, 152
Hoffman, Allan A., 203
Hoffman, Byron J., 155
Hoffman, Faye G., 166
Holbrook, David J., Jr., 125, 220
Hollister, William G., 192
Holscher, Edward C., Jr., 179
Holt, James B., 137
Holt, Windsor A., 166
Honeycutt, L. Fuller, 197
Hook, Gary E.R., 221
Hoole, Axalla J., 151, 73, 199
Hopper, William F., 155
Horstman, Donald H., 156
Horton, Pamela B., 138
Houston, Frank M., 132
Howard, James F., Jr., 163, 151, 214
Howard, Paul O., 137
Howes, Barry R., 139, 135, 143
Hresko, Michael B., 194
Hsiao,Henry S., 202, 214
Hu, Ping-Chuan, 180
Huang, Eng-Shang, 151, 159, 225
Hubbard, William Colvin, 178
Hudson, Richard Page, Jr., 170
Huff, Olsen, 179
Huffines, William D., 170, 5, 7, 10
Hulka, Barbara S., 135, 225
Hulka, Jaroslav, F., 165
Hull, James H., 155
Hunt, Clyde Mc., Jr., 123
Hunt, Oliver, R., Jr., 203
Hunter, John Dane, 155
Hunter, Rosemary, 193
Hunter, W.B., 193
Hussey, Howard S., 136
Hutcheson, James S., 193, 202
Hutchins, Robert H., 155
Hutchison, Clyde A., 158, 210
Hyde, Austin T., Jr., 155

Ibrahim, Michel A., 199
Ifft, Robin D., 180
Iglesias, Octavius E., 172
Ingram, David L., 177
Irigaray, Peter J., 193
Irons, George V., Jr., 152
Irvin, J. Logan, 124
Ives, Timothy J., 136

Jackson, Patricia B., 180
Jackson, Robert D., 179
Jacobs, Steven J., 153
Jacobson, Kenneth A., 117
Jacobson, Peter Lars, 164
Jacoway, John R., 170
Jain, Sagar C., 193
Jamerson, Ann L., 144
James, Barbara E., 193
James Charles G., 136
Jaques, Paul F., 196
Jarosak, Peter J., 179
Jaski, Thomas John, 155
Jay, Robert E., 147
Jeffcoat, Alex R., 156
Jemsek, Joseph Gregory, 155
Jenkins, Albert Milton, 198
Jenkins, D.B., 118
Jennette, John C., 171
Jensen, Eric W., 193, 151, 232
Jessee, William F., 199
Jessup, Pamela K.H., 137
Johnson, George, Jr., 201, 7, 10, 17
Johnson, Harry Wallace, 166
Johnson, Marjory W., 144
Johnson, Martin K., III, 156
Johnson, M.S., 137
Johnson, Mary Pauline, 179
Johnson, Richard N., 163, 205, 214
Johnston, Frank S., Jr., 153
Johnston, John G., 179
Johnston, Malcolm, 117
Johnston, Richard, 196, 145, 146
Jones, Franklin D., 202
Jones, James G., 135
Jones, Jerry A., 155
Jones, Joseph Kempton, 135, 152
Jones, Katherine, 144
Jones, Mary Ellen, 124, 8, 9
Jones, Morris Alexander, Jr., 198
Jones, Otis Hunter, 166
Jordan, Weldon Huske, 155
Joyner, Samuel B., 152
Joyner, William S., 135, 152
Judd, B.H., 210

Kaasa, Laurin J., 166
Kafer, Enid R., 122, 188
Kahler, Stephen G., 179
Kahn, Joseph W., 136
Kamm, Rick Rande, 166
Kane, Richard D., 203
Kanof, Elizabeth P., 132
Kaplan, David M., 137
Karb, Kenneth, 155
Kassens, Catherine H., 133
Kates, Robert A., 123
Katz, Jeffrey David, 155
Kaufman, David G., 170, 125, 220, 225
Kaufman, Michael David, 155
Kaufman, William K., 172
Keagy, Blair A., 202
Keene, Janice C., 144
Keener, Joseph Keith, 156
Keeney, Ronald E., 179
Kehrl, Howard R., 227
Keller, David C., 136
Keller, John G., 221
Kelly, Edward A., 137
Kelly, Luther W., Jr., 152
Kennedy, Willard Lee, 156
Kenney, Richard D., 178
Keys, Susan L., 139
Khan, Iqbal M., 156
Kierszenbaum, Abraham L., 117
Kihlstrom, Bruce L., 203
Kileff, Moyra E., 123
Killebrew, Kate, 196
Kilpatrick, George R., Jr., 156
Kim, C.S., 164
Kimbrell, Odell Culp, Jr., 152
King, Nancy M.P., 200
King, R.A., 214
King-Thomas, Linda L., 143
Kirk, Charles D., 123
Kirkman, Henry Neil, 176, 210, 224
Kirkpatrick, B., 195
Kiser, Jefferson B., 164
Kizer, J. Stephen, 151, 182, 215, 224
Klapper, David G., 159
Klein, Carol, 137
Klein, Kenneth B., 155
Klimas, John T., 179
Knodaparast, Hamid, 155
Knobelock, F.X.C., 148, 178
Knowles, Michael R., 151
Knox, A.E., 180
Koch, Gary, 227
Koch, William E., 117
Kokas, E.B., 187
Kole, Ryszard, 182
Konanc, Judy T., 194
Kornegay, Hervy B., 135
Koury, George Eli, 155
Kowalsky, Richard J., 196, 145
Kramer, Norman J., 153
Kramer, Ralph Lewis, 166
Kraybill, Ernest N., 176
Krebs, Helmut, 118
Kredich, Deborah W., 179
Krenitsky, Thomas A., 125
Krigman, Martin R., 170, 214, 220
Krohn, John R., 204
Kroncke, Frederick G., Jr., 166
Kronhaus, Alan Keith, 156
Kruse, Richard S., 197
Kuhne, Albert K., 137
Kuhns, William J., 170
Kunkel, Thomas A., 159
Kuno, Motoy, 188
Kunstling,Ted R., 153
Kupper, Cynthia A., 204
Kwock, Lester, 196, 118

Lachiewicz, Paul F., 202
Lackey, Robert S., 198
LaForce, Craig F., 179
Lail, Jennifer L., 180
Lancaster, Michael S., 195
Landes, Ralph R., 202
Landis, Edward E., Jr., 152
Lane, Harold C., 178

Lane, John W., 167
Lane, Robert E., 135
Lane, Timothy W., 151
Langdell, Robert D., 170
Langford, George M., 188
Langley, C.H., 211
Lapetina, Eduardo G., 154
LaPrade, Bennett W., 166
Lara, Patricio P., 194
Larimore, Walter L., 137
Lassiter, Richard E., 167
Lassiter, William E., 150
Lauder, Jean M., 117, 215
Lauria, Marie Mulligan, 180
Lawrence, Hal Clifford, 167
Lawrence, John E., Jr., 153
Lawson, Edward E., 177
Lay, Douglas M., 117, 215
Layton, Dennis Sheldon, 155
Layton, Thomas L., 147
Lazarus, Lawrence H., 183
Lea, James W., 134, 233
LeBauer, Edmund Joseph, 153
LeBauer, Eugene S., 155
LeBauer, S.F., 152
LeBauer, Samuel M., 155
Ledbetter, John W., 164, 135
Lee, Terrence J., 155
Lee, Thomas, A., 138
Lefkowitz, David, 179
LeGrys, Vicky A., 141
Leighton, Stephen L., 137
Lemasters, John J., 117
Lemon, Stanley M., 151
Lentz, Barry R., 125
Lentz, Julian C., Jr., 153
Leonard, Donald D., 171
Leonard, John R., III, 204
Lesesne, Henry R., 151, 5
Lesser, Philip S., 179
Lester, Gayle E., 152, 182
Leung, Paul, 147
LeVeau, Barney F., 144, 135
Levin, Kenneth J., 122
Levin, Mina L., 155
Levine, Ronald H., 179
Levinson, Sidney L., 155
Levitin, Peter M., 153
Levitt, Stephen R., 195
Levy, Stanley B., 133
Lewis, Arch Ritchie, 155
Lewis, Claudeline P., 194
Lewis, Howard T., 169
Lhotsky, Dora M., 155
Li, Steven S., 125
Light, Alan R., 188
Light, Kathleen C., 195, 188
Lina, John R., 197
Lin, J.C., 125
Lincourt, John M., 138
Lindley, Lauren Hoskins, 167
Lindsey, Dianne, 144
Lineberger, Herman P., 193
Lineberry, Charles G., 188
Lipkin, Mack, 200
Lipton, Barbara S., 194
Lipton, Morris A., 192, 10, 124, 214, 224
Liptzin, Myron B., 193, 5
Little, Edgar W., 179
Littlejohn, Hawk, 200
Lockhart, Walter S., Jr., 204
Lockwood, Marilyn A., 156
Loda, Frank A., Jr., 176
Loehr, Walter J., 203
Logan, William S., 133
Lomax, Charles W., 167
London, William Lord, IV, 178
Long, Fred J., Jr., 204
Long, John C., 133
Long, Virginia B., 194
Long, Walker A., 180
Loosen, P.T., 193, 215
Lord, Susan T., 172, 211
Lotwin, Richard S., 156
Love, James McLean, 164
Lowman, Joseph C., 136
Lucas, C. Clement, 136
Lucas, Carol L.N., 202, 205
Lucchesi, J. C., 210
Lucey, Donald T., 203
Lucier, George W., 125, 221
Lund, H.Z., 132, 171
Lund, John Jefferson, 156
Lund, Pauline K., 188
Lundblad, Roger L., 170, 124
Lupton, Emmett Stevenson, 132
Lusk, John Alexander, III, 152
Lyle, Carl B., Jr., 150, 231
Lynch, John Franklin, Jr., 178
Lynn, Clabe W., Jr., 194

McBay, Arthur J., 170, 220
McBee, James W., 153
McCain, John Lewis, 153
McCaleb, Jane H., 137
McCall, Marvin M., III, 152
McCarthy, Kenny D., 182, 215
McCartney, Cheryl F., 193
McCartney, Michael L., 164, 206
McCartney, William H., 196, 145
McConnell, Eleanor S., 156
McCue, Jack D., 151
McCutchan, James Hutton, Jr., 153
McDaniel, William J., 204
McDevitt, Noel B., 203
McDonagh, Patrick H., 194
McDonald, K.M., 139
McDonald, Neil J., 200
McGaghie, William C., 134, 234
McGee, John Asbury, Jr., 166
McGhee, Terence Barclay, 164, 136
McGinnis, Michael R., 159, 171
MacGuire J.H., 220
McIlwain, David L., 188, 215
MacIntosh, Victor, 137
McKay, Hamilton W., 179
MacKay, J. Calvin, 153
McKee, Daphne C., 193
Mackie, A., 123
MacKenzie, P.M., 171
McKenzie, Sheppard Allen, III, 167
McKeown, William D., 156

MacKinnon, Joyce, L., 144
McLaurin, Sue Evelyn, 144
McLelland, Robert, 197
McLendon, Martha S., 167
McLendon, William W., 170, 10, 17, 230
McLeod, M.M., 180
McMillan, Campbell W., 176, 229
McMillan, Thomas H., Jr., 152
McRae, William K., 155
McRee, Christine J.E., 194
McRee, J. Douglas, 194
MacPhail, R.C., 215
MacQueen, Donald M., 153, 178
MacRae, Edith K., 117
Madison, Donald L., 199, 72, 134
Madry, Herbert Raymond, Jr., 197
Magyari, Patricia A., 180
Mahaffey, Robert B., 147
Mahaley, M. Stephen, Jr., 201, 214
Maher, Fayez A., 155
Mailman, R.B., 195, 182, 215, 221, 224
Malling, Heinrich V., 172, 210
Malouf, Nadia M., 171
Mandel, Stanley R., 201
Mandell, James, 202, 5, 177
Mandell, Valerie, 196, 5
Maness, Patricia F., 125, 211
Mangano, Charles A., 155
Manire, George P., 7, 158
Mann, Elizabeth S., 122
Mann, James T., III, 155
Mann, John D., 163, 151, 215, 220
Marcus, Lee M., 193
Maroni, G.P., 210
Marroum-Kardous, Marie-Claire, 172
Marshall, Charles Foster, 179
Marshall, Lawrence M., 188, 215
Marshall, William R., 135
Marshburn, Elisha T., Jr., 152
Marston, Charles T., Jr., 180
Martin, Dennis L., 164, 136
Martin, Edward S., 179
Martin, H., 188
Martin, J. Paul, 135
Martin, Nancy J., 194
Martin, Philip L., 169
Martinkosky, Stanley J., 204, 148
Martonen, Ted B., 227
Mason, Lockert, 202
Mason, Ronald P., 221
Mass, Marc J., 172
Massey, Thomas Neely, Jr., 153
Mathis, John M., 197
Mattern, William D., 150, 8, 10
Matteson, Stephen R., 197
Matthysse, A.G., 210
Mauro, Matthew, 196
Max, Richard J., 197
Maxwell, Betty F., 159
Maxwell, Robert A., 182
May, Ronald B., 179
Mayberry, Harvey E., 118
Mayer, Eugene S., 134, 8, 10, 21, 150
Mazzaglia, Joseph R., 194
Mechanic, Gerald L., 124
Meeker, Rick, 163
Meissner, Gerhard W.D., 125, 188, 214
Melnick, Irving, 203
Mendell, Lorne, 188
Menetrey, D., 188
Mengel, Nanette V., 195
Menscer, Darlyne, 137
Meriwether, Rebecca Ann, 137
Merritt, John C., 168
Merwarth, Charles, R., 152
Mesibov, Gary B., 193
Messenheimer, John A., 163, 151
Metz, David, 200
Meyer, Harold, 177
Meyer, Robert S., 137
Mezer, Howard C., 167
Mickey, Don D., 202
Milks, Lucy Davis, 141
Miller, A.T., 188
Miller, C. Arden, 176
Miller, David J., 144
Miller David T., 171, 230
Miller, Edith H., 156
Miller, Horace, W., Jr., 155
Miller, J.N., 123
Miller, Milton L., 192
Miller, Philip R., 155
Miller, R. Michael, 137
Miller, William S., 133
Millhorn, David E., 188, 215
Mills, Kenneth C., 194
Millward, David Kent, 153
Minton, Bland V., 140
Mintz, Rudolph I., Jr., 167
Mitchell, Clifford L., 182, 215
Mitchell, Maryls M., 143
Mitchell, Ruth U., 143
Mittelstaedt, Carol A., 196, 146
Miya, Tom S., 181, 220
Modrow, Peter A., 123
Mohnkern, Janet K., 138
Mohr, Jack E., 167
Monroe, J. Thaddeus, Jr., 194
Monson, Donald M., 198
Montgomery, Royce Lee, 118, 215
Mooney, Alfonso, J., III, 136
Moore, David H., 179
Moore, Horace G., Jr., 203
Moore, John Andrew, 155
Moore, John H., III, 156
Moore, John W., 188
Moore, Louis P., 194
Moore, Ralph B., 179
Moore, Richard J., 194
Moos, Merry K., 167
Morcos, Victor H., 194
Morell, Pierre, 124, 5, 214, 224
Morff, Robert J., 188
Morgan, Benjamin E., 167
Morris, Arthur Sherman, Jr., 167
Morris, Charles R., 177
Morris, George Thomas Arnold, 156
Morris, John Francis, 179
Morris, John R., 204
Morris, Peter J., 200, 180
Morrow, Sarah Taylor, 177
Morton, Duncan, 179

Moser, Artus M., Jr., 153
Moser, Wade H., 197
Moss, Alvin H., 155
Moss, Nicholas G., 188
Moylan, Joseph J., 195
Mueller, Robert A., 122, 181, 214
Munroe, John Francis, 155
Munson, Eric B., 8, 9, 17, 18, 200
Munson, P.L., 181, 214
Murphy, Charles A., Jr., 123
Murphy, Robert J., 136
Murphy, Thomas Lynch, 153
Murray, Gordon F., 201
Mushak, Paul, 171, 220
Myers, Richard S., 204
Myers, Robert D., 192, 181, 214, 227
Myers, Thomas Edward, 167

Nadel, Scott M., 155
Nayfeh, Shihadeh, 124
Nebel, William A., 166
Neijstrom, Eric Sherwood, 155
Nelson, Charlene M., 144
Nelson, Donald John, 183
Nelson, Paul, 200
Nelson, William G., 194
Nesbit, William Michael S., 153
Nettesheim, Paul, 172, 221
Newbold, John E., 159, 211, 231
Newell, Lanning Richard, 156
Newman, Simon L., 152, 159
Newmark, Charles S., 193
Newsome, James F., 201
Newton, Dale A., 155
Nichol, Charles Adam, 182
Nicks, Dennis B., 204
Nicolay, William Robert, 197
Nixon, William P., Jr., 153
Nolan, Clyde, Jr., 133
Noneman, Jack W., Jr., 152
Nomeir, Marguerite B., 148
Norfleet, Edward A., 122, 5
Nuzum, Claude T., 151

O'Bar, Paul R., 152
Oberlin, Deloy C., 123
Obrist, Paul A., 192, 214
O'Cain, Charles Frank, 155
O'Keefe, Edward J., 132
Older, Robert A., 198
Olin, David B., 153
Olley, John G., 194
Olmert, Joseph P., Jr., 155
Olson, Beverly A., 156
Olson, David G., 155
Olson, P. Richard, 135
O'Neil, John J., 156
Ontjes, David A., 149, 9, 17, 181
Oppenheim, R.W., 215
O'Rand, Michael G., 118, 68
Orlando, Roy C., 151, 5
O'Rourke, James R., Jr., 153
Orr, Samuel L., 172
Orringer, Eugene P., 151
Osberg, James William, 193, 71
Ostrow, B.S., 194
O'Tuama, L. A., 163, 214
Oxford, Gerry S., 188, 69, 215

Paar, John Arthur, 153
Pace, John S., 123
Packer, John W., 204
Paddison, George M., 198
Pagano, Joseph S., 150, 10, 158, 225
Page, Ernest B., Jr., 152
Pallotta, Barry, 182
Palmer, Jeffress G., 150
Pantell, Jeremy P., 168
Parke, James Clifton, Jr., 177
Parker, John C., 150
Parker, Linda B., 139
Parker, Samuel L., Jr., 167
Parker, Talbot F., Jr., 167
Parnell, Jerome P., II, 204
Parr, Carol Ann, 144
Parrish, Marilyn Watson, 145
Parsons, James S., 156
Partain, Clarence L., 198
Paschal, George W., III, 204
Patrick, Donald L., 199
Patterson, David R., 155
Patterson, F.G., 152
Patterson, J.F., 122
Pattishall, Evan G., 179
Paul, Robert G., 148
Payne, J.A., IV, 200
Payne, Robert B., 152
Peach, Roy, 118
Pearlman, William H., 182
Pedersen, Cort A., 194
Peiffer, Robert L., Jr., 168, 171
Pendse, Prabhakar K., 179
Peng, Tai-Chan, 182, 215
Penniall, Ralph, 124
Pensler, Leslie, 177
Perez-Reyes, Mario, 193
Perkins, John P., 181, 9, 214
Perl, Edward R., 187, 9, 69, 214
Perlmutt, Joseph H., 188
Perry, John R., 196, 145, 227
Peters, Robert W., 147
Petersen, Christopher A., 179
Peterson, David M., Jr., 155
Peterson, Herbert B., 167
Peterson, Hugh D., 201
Petrusz, Peter, 118, 215
Phillips, H.T., 199
Phillips, Marion, 8, 10
Phillips, William A., 132
Piantadosi, Claude, 124
Pick, James R., 170, 230
Pickard, Carl G., Jr., 151, 199
Pickard, Faye D., 200
Pierson, George H., 197
Pierson, Scott C., 138
Pierson, Willard C., Jr., 153
Pike, Isadore Murray, 155
Pillsbury, Harold C., III, 202
Pinn, Melvin T., Jr., 136
Pisetsky, Ingrid B., 194
Pittman, A.W., 155

Pittman, William Bryan, 156
Pizer, Morton Eli, 178
Pizer, Stephen M., 197, 205
Pledger, W. Jackson, 182, 225
Plonk, James W., 153
Pollitzer, William S., 117, 210
Pollock, Hoke D., 204
Pollock, Morris A., 155
Poole, Doris T., 182, 220
Pope, Fergus, 136
Pope, Janey L., 195
Pope, Thomas Lee, Jr., 197
Popio, Kenneth A., 151
Porter, Patricia B., 147
Porter, William G., 153
Postma, Duncan S., 202
Powell, Don W., 150
Powell, John R., 182
Powell, Wiliam C., 180
Powers, Stephen K., 202
Prange, Arthur J., Jr., 192, 9, 17, 214, 224
Prather, D.L., 137
Pratt, Robert M., 118
Pratt, Samuel B., 133
Prazma, Jiri, 202, 215
Preston, Edwin, T., 203
Preyer, Richardson, 200
Price, Loraine E., 156
Price, Robert E., Jr., 204
Priest, B., 159
Pritchett, N.G., 152
Probst, Myra Ann, 144
Propst, R.H., 164, 206
Proctor, Camilla A., 156
Proctor, Herbert J., 201
Proctor, William Ivan, 153
Pryzwansky, Katherine Barthalmus, 172
Pukkila, P.J., 211
Puthenveetil, John V., 155
Putnam, Samuel M., 151

Quigless, Milton D., Jr., 204
Quigley, Michael John, 137
Quint, Stephen R., 163, 205

Raasch, Ralph H., 155
Rabold, Leonard J., 152
Raft, David D., 192, 150
Rahija, Richard, 230
Raj, Madhwa H., 165, 182
Rall, David, P., 182
Rallis, Michael George, 155
Ranga, Venkatachalam, 151, 227
Rankin, Rufus P., Jr., 166
Rasberry, Edwin A., Jr., 152
Rathbun, Mary A., 178
Ravenel, Samuel D., 178
Recordati, Giorgio, 188
Rector,Frederic E., 179, 136
Reddick, Robert L., 171, 5
Reece, Donald B., II, 137
Reed, Martha S., 140
Reese, Mitchell C., 179
Reibel, Donald, B., 204
Reid, David M., 195
Reid, John H., 133
Reid, Thomas B., III, 156
Reindollar, Robert W., 155
Reisner, Howard M., 171, 159, 211
Reist, Parker, 227
Reiter, Lawrence W., 183, 221
Renuart, Adhemar W., 164
Renwick, Sandra M., 140
Resnick, Michael A., 172, 211
Retchin, Sheldon M., 151
Reynolds, Frank R., 177
Rhodes, Cecil David, Jr., 156
Rhodes, John F., 204
Rhyne, Robert L., Jr., 200
Rice, Lucian C., 153
Richardson, A. Cullen, 166
Richardson, W.P., 134
Rieman, Gilbert F., 165
Riley, James C., 153
Rimer, Bobby A., 166
Ringwalt, Sharon S., 148
Ripley, Lynn S., 159
Rizzolo, Peter J., 133
Roberson, Virgil O., III, 123
Roberts, Harold R., 150, 10, 170, 228, 230
Roberts, Surry P., 155
Roberts, Thomas A., Jr., 155
Robicsek, Francis, 203
Robie, William Adlai, 179
Robinson, Norman J., 153
Roddey, Oliver F., Jr., 179
Rogers, Charles S., 151
Rogers, David Y., 135
Rogers, Joan C., 143
Rogers, John F., 151, 182
Rollins, Robert L., 194
Rood, Mary M., 194
Rosen, Richard J., 153
Rosenberg, Joel B., 155
Rosenman, Julian G., 198
Rosner, Michael J., 202
Ross, Dennis W., 171, 5, 151, 230
Ross, Gordon D., 151, 159
Ross, M.H., 200
Rothenberger, Lee Ann, 138
Rourk, Jane D., 143
Rouse, Doris J., 206
Rowe, William T., 153
Royal, Billy W., 194
Rubin, A.S., 178
Rubin, David M., 179
Rucker, Tinsley, 136
Runyan, Desmond K., 200, 177
Ruppenthal, Carl Robert, Jr., 152
Ruskin, Jerome, 153
Russ, Donald J., 153
Russell, Jeffrey K., 153
Russell, John H., 152
Rust, Carl K., III, 153
Rustioni, Aldo, 117, 118, 214
Rutala, William A., 152

Sachs, Kurt, 153
Sadler, Thomas A., 118, 68
Sakata, Robert, 139, 9, 18, 135, 137, 147, 228

Saldias, Carlos A., 195
Salisbury, Kent W., 153
Salmon, Robert B., 198
Salter, Kathleen E., 179
Salter, Teresa P., 179
Sancar, Aziz, 125
Sancar, Gwendolyn B., 125
Sanchez, Alex F., Jr., 136
Sanders, Shirley, 194
Sandler, Robert S., 151
Sar, Madhabananda, 118, 215
Sartor, Ryan B., 151
Sarubbi, Felix A., 153
Satava, Richard M., 204
Saunders, D.S., 152
Saunders, Wade H., III, 153
Sauter, Suzanne V., 151, 18, 228
Sawyer, John Wilson, 154
Sawyer, William T., 136
Scanlan, James George, 156
Scarborough, Dawson E., 166
Scarborough, Gene A., 182
Scatliff, James H., 196, 9, 18
Schaefer, Morris, 193
Schaaf, Robert E., 197
Schafermeyer, Robert W., 179
Schall, Stewart A., 177
Schiebel, Herman M., 203
Schiller, Carol M., 125, 221
Schiller, Ernest L., 179
Schlaseman, Guy Walter, 197
Schmitt, Raymond F., Jr., 193
Schopler, Eric, 192, 232
Schorr, Jessica L., 136
Schroeder, C.S., 177, 193
Schroeder, Stephen R., 193, 224
Schuch, Charles P., 143, 135
Schutte, Harold D., 180
Schwab, John H., 158
Schwankl, James E., 180
Schwartz, Robert P., 178
Scott, Harry W., 133
Scott, Samuel E., 156
Scott, Stephen G., 138
Sealock, Robert W., 188, 215
Sedivec, Mathius J., 189
Seeds, John W., 166
Seek, M.M., 156
Semenoff, Daniel J., 136
Senter, Jean R., 144
Senter, Richard G., 154
Serano, Richard D., 164
Sessions, John T., Jr., 150
Sevier, Robert E., 154
Shackelford, Robert, 135
Shah, Nirupama B., 156
Shahady, Edward J., 134, 9, 18
Shapiro, Marvin B., 154
Sharp, D.G., 158
Sharp, Michael C., 177
Sharpless, Martha K., 176
Shaver, Joyce C., 155
Shaw, Dale R., 197
Shaw, Frank S., 179
Shaw, Jan, 180
Shea, John J., Jr., 203
Shea, V., 194
Sheaffer, Charles I., 178
Shelburne, Palmer, F., 152
Sheldon, George F., 201, 9, 18
Shellhorse, Gloria Y., 155
Sheps, Cecil G., 199, 134
Sheps, David S., 151, 227
Shermer, Richard W., 171, 140
Sherrow, Allen J., 194
Shigley, R. Hal, 195
Shinkman, P.G., 214
Shoaf, Edwin H., Jr., 155
Shub, Mitchell D., 177
Shuford, William F., 154
Shultz, Kirkwood T., 154
Shy, Carl M., 135, 220
Sibrack, Gerald B., 195
Sides, Evin H., III, 154
Siegal, Gene P., 171
Siegel, Earl, 178
Sigmon, J. Lewis, Jr., 135
Silber, David L., 176
Sillmon, David W., 154
Silverman, Lawrence M., 171, 125
Siman, Jose Jorge, 200
Simons, William J., 154
Simpson, Kit N., 139
Simpson, Ross J., Jr., 151
Singer, James W., 178
Singletary, William V., 155
Singleton, Mary C., 143
Siscovick, David S., 151
Sisko, Frank E., 123
Skinner, Barbara P., 144
Skinner, Bron D., 135
Slatkoff, Susan F., 137
Slaton, Darlene S., 144
Slatt, Lisa M., 135
Slifer, Barbara L., 182
Sloan, Jerry, 195
Sloane, Phillip D., 135
Slotnick, Lawrence S., 155
Small, Ernest W., 201
Smelzer, Timothy H., 154
Smith, Charles E., 192
Smith, David M., 189
Smith, Donald D., 178
Smith, Gary J., 172
Smith, Henry L., 180
Smith, H.L., 193
Smith, James H., 155
Smith, O.N., 152
Smith, Pamela M., 167
Smith, Philip P., 155
Smith, Richard L., 154
Smith, Roger E., 154
Smith, Stephen W.,154
Smith, Timothy C., 156
Snitz, Arnold T., 180
Snow, Teena L., 156
Snyder, James W., 154
Snyder, Melinda S., 180
Sobsey, M., 159
Solberg, M. Patrice, 200
Soltys, John J., Jr., 194
Somers, James E., 194

Sorrow, John M., Jr., 150, 8
Spain, Robert S., 154
Spangenthal, Selwyn, 156
Spangler, Ernest B., Jr., 198
Spangler, Harold B., 178
Sparling, Philip F., 158, 9, 69, 150, 210
Spector, Thomas, 183
Spencer, Donald C., 137
Spencer, Roger F., 192
Speros, Thomas Lee, 137
Spielman, Fred J., 123
Spilker, Bertram A., 155, 183
Spinola, Stanley M., 180
Sprague, David H., 122
Sprunt, William H., III, 198
Staab, Edward V., 196, 145, 170
Stabler, Brian, 193, 133, 177
Stafford, Darrel Wayne, 125
Stafford, Steven J., 202
Stallings, Martin W., 180
Stanley, Ronald J., 133
Starek, Peter J.K., 201
Starmer, Charles F., Jr., 204
Steinkraus, Gregory E., 139
Stevens, Elliott Walker, 154
Stevens, J.B., 152
Stevens, R. Carole, 141
Stewart, Albert, Jr., 154
Stewart George T., 167
Stewart, William C., 178
Stiefel, Joseph W., 164
Stiles, Eddie P., 136
Stover, Betsy J., 182, 220
Straight, David L., 152
Straughn, W.R., 158
Strauss, Ronald P., 200
Strayhorn, Gregory, 135
Stritter, Frank T., 134, 8, 10, 234
Strope, Gerald L., 177, 227
Stuart, Ann E., 188
Stumpf, Walter E., 117, 182, 214, 220
Stutts, Monroe J., 152
Suberman, R.l., 197
Suberman, Rick, 198
Sugg, William C., Jr., 152
Sugioka, Kenneth, 122
Sugioka, Mary, 180
Sulik, Kathleen K., 118, 168
Sullivan, Raymond C., Jr., 156
Sullivan, William G., 203
Summer, George K., 124, 178, 224
Summerlin, Arthur R., 166
Summerlin, Harry H., 135
Sumpter, Edwin A., 178
Sundberg, Thomas Clarke, 156
Sutton, Richard L., 155
Svenson, Robert H., 154
Swaim, Lindian J., Jr., 167
Swanson, Mark E., 180
Swanton, M.C., 170
Swanstrom, Ronald I., 125
Swenberg, James A., 172
Swift, Michael R., 150, 71, 210, 224
Swift, Ronnie G., 194
Switzer, Boyd R., 126
Tafeen,Stuart O., 133
Taft, Timothy N., 202
Tait, Jeffrey, 137
Talbert, Luther M., 165
Talbot, Addison A., III, 135
Talley, Joseph H., 136
Talmage, Roy V., 201, 182
Tamisiea, J. Richard, 154
Tannenbaum, A. Jack, 152
Tart, David E., 133
Tatum, Ben S., 167
Taylor, Catherine A., 193, 134, 177
Taylor, Isaac M., 7
Taylor, James A., 154
Taylor, Michael A., 180
Teel, Sidney, K., 194
Telfer, James G., Jr., 155
Temple, Peter L., 136
Tennant, Stanley N., 156
Tennison, Michael B., 163, 177
Teplin, Stuart W., 177
Thacker, Robert K., 137
Thalinger, Alan R., 155
Thomas, Alan E., 155
Thomas, Colin G., Jr., 201
Thomas, Jo Anne L., 141
Thomas, William E., 194
Thomas, William G., 202, 148, 214
Thomason, Michael H., 204
Thompson, David G., 200
Thompson, Frank A., 155
Thompson, Hilary F., 200
Thompson, John A., Jr., 133
Thompson, Robert L., 171
Thorp, James H.M., 167
Thorp, Lewis S., 154, 135
Thorpe, Robert L., 144, 197
Thrash, W. Virgil, 154
Thresher, Jill C., 148
Thrower, Susan M., 136
Thullen,James D., 177
Thurber, David C., Jr., 156
Thurman, Ronald G., 182, 220
Tidwell, Richard R., 171
Tillman, Shirley S., 155
Tilson, Hugh A., Jr., 221
Tilson, Hugh H., 200, 135
Tilyard, Linda N., 140
Timmons, Robert L., 203
Tinsley, Ellis A., Jr., 203
Tipton, Samuel R., 137
Todd, Juanita M., 180
Toews, Arrel D., 125
Tolley, Aubrey G., 193
Tomsick, Robert S., 132
Toomey, Timothy C., 194
Topal, Michael D., 171, 125, 211
Tortora, Frank L., Jr., 204
Toverud, Svein U., 182
Townsend, Murphy F., Jr., 153
Traut, Thomas W.,125
Tres-Kierszenbaum, Laura L., 118
Trier, William C., 201
Tsui, B.M.W., 197, 205
Tucker, Beverly, 135
Tucker, George R., Jr., 154, 135

Tucker, Landrum S., 194
Tucker, Paul C., Jr., 154
Tucker, Walter R., 137
Tulchinsky, Theodore H., 200
Turlington, Wade R., 136
Turner, A.G., 220
Turner, Gilbert W., 144, 197
Turner, William H., III, 133
Twarog, Robert, 159
Tyler, Eileen P., 123
Tyler, Michael J., 137
Tysinger, John R., 155

Ulshen, Martin H., 177, 18
Underwood, Louis E., 176
Ungaro, Peter C., 151
Unger, Henry A., 204
Ussery, Lon E., 193
Utiger, Robert D., 150, 229

Vaithianathan, T., 172
Vallecillo, Reinaldo, N., 123
Van Bourgondien, Mary E., 193
Van Hoy, Joe M., 203
Van Nynatten, Fred, 155
Van Velsor, Harry, 133
Van Wyk, Judson J., 176
Varia, Mahesh A., 198
Vatz, Benjamin, 152
Vaughan, Marjorie S., 167
Vaughan, Robert W., 122, 9, 10, 18
Vaughan, Ross. L., Jr., 177
Veazey, A.H., Jr., 137
Venters, George C., 204
Vernon, Charles R., 194
Verwoerdt, Dorothy T., 195
Vest, Howard R., 123
Vick, Henry V., 136
Vierck, Charles J., Jr., 188
Villier, James A., 155
Vincent, Lawrence M., 196
Vinson, Daniel C., 136
Vinson, Fred A., Jr., 195
Visser, Valya E., 180

Wagner, Robert H., 170, 125
Wagoner, David Kirk, 180
Wainer, Howard S., 152
Waldenburg, Leopold M., 204
Walker, David H., 171
Walker, Phillip J., 155
Walker, Preston A., 195
Walker, Richard I., 150
Wall, Andrew Jackson, 195
Wall, Audrey V., 156
Wall, Monroe E., 152
Walton, Leslie A., 165
Walton, Richard F., 134
Ware, Grady, 168
Wargin, William A., 221
Warner, Charles Ernest, 180
Warren, Donald W., 201
Warren,Julian M., 137, 156
Warren, Nancy J., 193
Warren, Robert W., 177
Warren, Sarah Lou, 134, 151
Warshauer, Samuel E., 152
Washburn, David B., 198
Waters, Lynn K., 148
Waters, Michael D., 221
Watson, Charles B., 122
Watts, N.B., 154
Weakly, James N., 188, 215
Weatherly, Carl H., 178
Weaver, Richard L., 178
Weaver, Zebulon, III, 154
Webb, Charles E., 135
Webster, William P., 170
Weeks, Kenneth D., 152
Wein, Robert Michael, 167
Weinstein, Robert Harvey, 195
Weintraub, Richard A., 156
Weisler, Richard H., 195
Weissman, James, 156
Weissman, Robert M., 202
Weissman, Susan E., 137
Welborne, Barry McN., 156
Welch, R.M., 221
Welham, Richard T., 167
Wells, Edwin J., 203
Wells, Ora J., 180
Wells, Robert J., 177
Welsch, Frank, 221
Welsh, George S., 193
Wendorff, Hermann J., 156
Weng, Ng K., 164
Werblin, Theodore Paul, 169
Werk, Emile E., Jr., 150
Wertman,Daniel E., Jr., 198
Wertz, Gail T., 158, 211
West, Ray E., 140
Wester, Millard, 135
Westmoreland, Patricia P., 133
Whaley, John L., 154
Whaley, Robert A., 196
Whatley, Joseph W., Jr., 178
Wheeler, Clayton E., Jr., 132, 8, 9, 18, 150
Wheeler, R.M., 152
Wheeling, James R., 135
Whisnant, John K., Jr., 178
Whitaker, Gregory K., 137
White, Gilbert C., 151
White, James R., 125
White, Mack W., 156
White, Susanne T., 177
White, T.R., 137
White, William E., 180
Whitener, Robert W., 194
Whitesides, Paul C., Jr., 156
Whitsel, Barry L., 188, 214
Whitt, James K., 193, 177
Widener, Herbert L., 156
Wiegand, Frederick G., 165
Wilcox, Benson R., 201
Wilcox, Claire B., 197
Wildman, Diane S., 157
Wiley, R.H., 214
Wilhelm, Cynthia L., 147
Wilhelm, Irma J., 144
Wilkins, Lucien S., 154

Wilkinson, Charles A., 203
Wilkinson, Henry A., III, 171
Willett, Robert W., 152
William, Thomas E., 178
Williams, Edward S., 154
Williams, P.F., 157
Williams, William T., Jr., 156, 180
Willis, Park W., IV, 151
Wilson, Charles V.B., 137
Wilson, Elizabeth M., 177, 125
Wilson, Frank C., Jr., 201, 72
Wilson, I. Glenn, 199, 8, 9
Wilson, James S., Jr., 204
Wilson, John E., 125, 214
Winfield, John B., 150, 10, 228
Wing, Richard L., 167
Wingfield, Martha S., 164
Winslow, Robert B., 203
Winter, Kenneth H., 197
Wise, Daniel E., 154
Witt, Philip L., 144, 137
Wolfenden, Richard V., 125
Wolff, George T., 135
Wong, Siew-Jyu, 180
Wood, Robert E., 177
Wood, William B., 151, 8, 10, 233
Woodard, Arch, 137
Woodard, Jerry C., 157
Woodard, Paul R., 123
Woodley, David T., 132
Woodruff, Leon F., 167
Woods, James W., Jr., 150
Woodard, Paul R., 123
Woodley, David T., 132
Woodruff, Leon F., 167
Woods, James W., Jr., 150
Woodside, Jack R., Jr., 123
Wortman, James, 156
Wray, Walter H., Jr., 137
Wright, James R., 204
Wright, Paul H., 204
Wynia, Virgil H., 156
Wyrick, Priscilla, B., 159
Wysor, William G., Jr., 154

Yankaskas, Bonnie C., 197
Yedidia, Avram, 200
Yellig, Edward B., 156
Yonce, Lloyd R., 188, 71, 205
Young, Clifton D., 156
Young, Daniel T., 150
Young, David A., 192
Young, Douglas B., 204
Young, Robert Ellsworth, 167
Young, William B., 154
Youngblood, William W., 125, 215, 224
Yount, James A., 154
Yount, William Jay, 150, 159

Zarzar, Nakhleh P., 193
Zellinger, Michael Jay, 157
Zilenik, Mary E., 197
Zimmerman, Samuel H., 157

The University of North Carolina at Chapel Hill